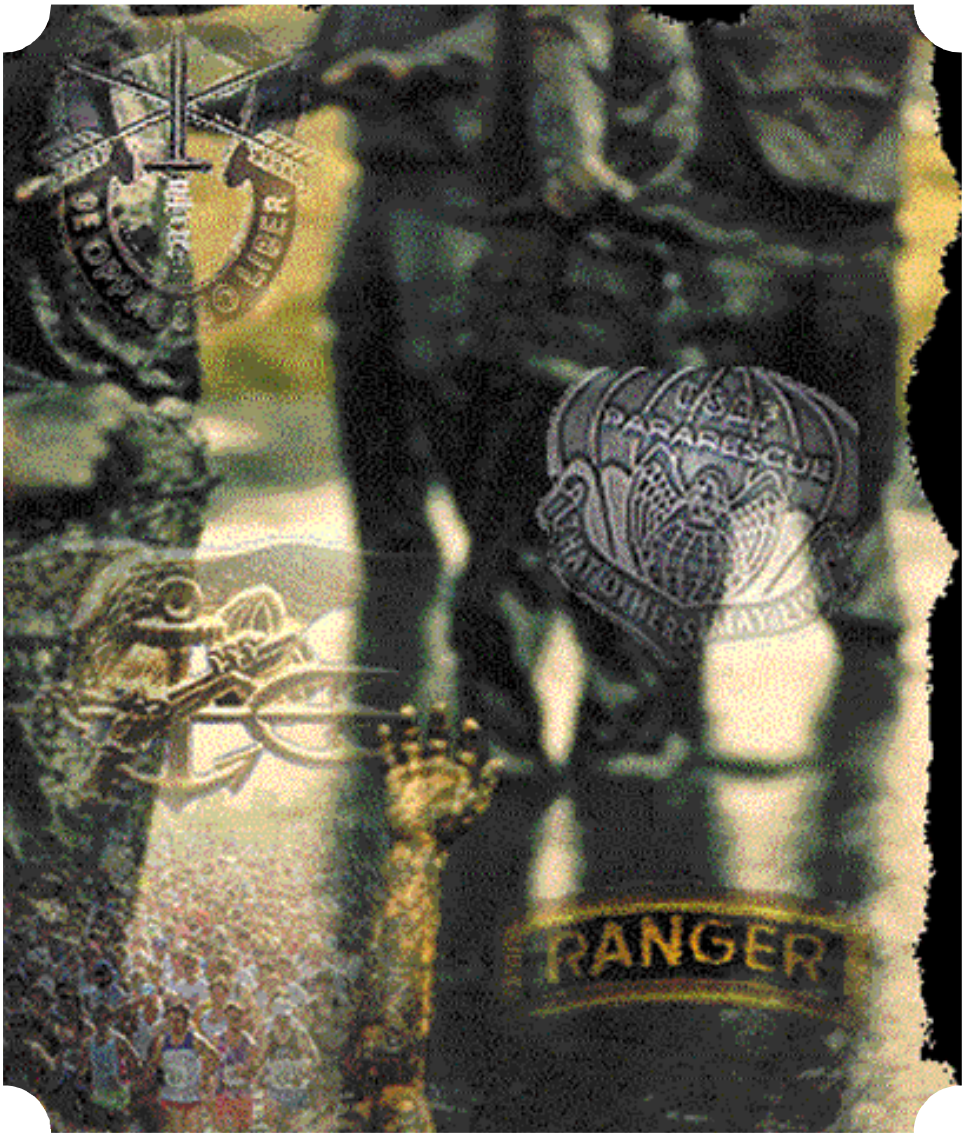
Volume 3, Edition 1 **Winter 2003**

Journal of Special Operations Medicine

A Peer Reviewed Journal for SOF Medical Professionals

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Dedicated to the Indomitable Spirit & Sacrifices of the SOF Medic

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From the Surgeon



Greetings from SOCOM Headquarters again. As we put this edition together it is the holiday season and all is well at home, while our SOF colleagues are still forward in any number of countries performing superbly and carrying out the missions assigned as Quiet Professionals.

This year is about to end and we can celebrate some significant accomplishments as it winds down:

1. Hemostatic Dressings are making their way into the field and the hands of our forward medical providers. The Chitosan Dressing is approved for use by the FDA and I got a message just this morning that the Fibrin Dressings are moving forward to the theaters for deployment under an Investigational New Drug (IND) protocol, and as a backup to Chitosan as needed.
2. The One-Handed Tourniquet is forward to our troops and is very functional. Additionally, the Rangers have put some ratchet-type tourniquets forward, all trying to answer the needs expressed by our far forward Medics/Corpsmen/PJs.
3. We successfully brought back medics from OEF and have their stories on record and we are directing our research toward fixes of "real problems" they encountered in the field.
4. The Tactical Combat Casualty Care panel of trauma experts from the services, the American College of Surgeons (Trauma Panel), the PHTLS experts, and others are rewriting the Advance Trauma Life Support protocols to meet combat tactical requirements, making our training and equipment more relevant to today's needs on the battlefield. We will field their recommendations on hypotensive resuscitation, hemostasis, new analgesia for combat, new fluids for resuscitation, new routes of administration, new airway management solutions, new antibiotic protocols for trauma, etc. By the way, our new United States/Surgeon General came to SOMA and reflected on his success as being a result of being a Special Forces 18D medic during the Vietnam era. He is a decorated veteran from that conflict. He also agrees that this work needs doing and is a volunteer on our panel of experts (he is a trauma surgeon, medical professor, and the force behind a state EMS system in his prior life). We are very fortunate!
5. This journal is still successful and continues to offer CME for our operators while also offering a venue for them to tell their stories of care in the field and share experiences as well as solutions. Recently our staff was successful in getting it placed on the web page at Joint Special Operations University allowing for increased exposure and access.
6. Our Health Surveillance Tool (PDA) is now forward and in the hands of many of our medics. We are in the process of fielding hundreds more of them to help our medics document their care and the exposures of our combatants while having a tool that contains their handbook and treatment protocols, generates SF-600s, Pre/Post Deployment Forms, etc.

Finally, continue to pass information to us about medical issues, successes, and challenges out there in the care of our troops in the field. Use the MEDTRUTH! Write an article for this journal! E-mail us your issues! Call us! This will help us make next year better than this year and make your life better, your rucksack lighter and your mission a little easier.

GBY/GBA dhammer

ENLISTED CORNER



SENIOR ENLISTED MEDICAL ADVISOR (SEMA), MSG
Michael A. Brochu

From the ROAD DOG in the BIG HOUSE,

Another quarter and year have flown by so let me update you on where we stand at the publishing of this journal:

USSOCOM State Department of EMS and Public Health: You may have heard a lot of speculation about the new statehood. It is real and will be a central governing authority responsible for the development, coordination, integration and administration of all activities within the state embodiment concerning pre-hospital emergency medical services and public health systems. USSOCOM State Department is looking to convene a State Requirements Board and Curriculum & Examination Board in late Jan or early Feb 03 to update and approve the SOCM curriculum. This will allow the state to issue the first SOF-P cards for class 02-03 which reports in April 03. Seek out your Senior Enlisted Medical Advisor for more information on the USSOCOM State Department of EMS.

Special Forces Medical Sergeants Curriculum Review Board: A SFMS CRB was conducted at Fort Bragg in Dec 2002. Many recommendations about the SFMS course content were made with the most significant regarding the Combat Trauma portion of the training. The board recommended that this training remain in its current week of training. When the logistical concerns (space, instructors, and equipment) are met in the future then the block of instruction may be moved into the SOCM course to provide a more comprehensive combat training cycle for all SOF medics.

Paramedic Bridge Program: The class that is in session now will be the last NREMT-P bridge class that SOCOM will fund. The SOCOM and component command surgeons have directed that all SOF medics are "certified Paramedics." This will allow the command surgeons to train their medics to mission standards and not to NREMT standards.

Long range dates for the future Joint Medical Enlisted Advisory Council (JMEAC):

25-26 Feb 03, NAVSPECWARCOM will host.
27-28 May 03, AFSOC will host.
26-27 Aug 03, USASOC will host.
1-2 Dec 04, USSOCOM will host at the SOMA Conference.

SOF Medics of the Year 2002: During the SOMA conference individuals from the SOF components are recognized and presented with the Mike Hollingsworth SOF medic of the year Award. All through the year SOF units submit nominees for the Medic of the Year award to their component Senior Enlisted Medical Advisor. Only one is selected to represent their SOF component.
The following individuals were chosen for 2002:

USASOC: SFC Cory Lamoreaux
NAVSPECWARCOM: HM1 Alejandro Becker
AFSOC: SSgt Brent A. Scott

Senior Enlisted Medical Advisor, MSG Michael Brochu presented the SOMA Superior Academic Award to the top graduates from the Special Operations Combat Medics Course 01-02. The class graduated 24 Jan 03. Both of the top graduates are from the Navy.



Distinguished Honor Graduate
HM1 Thomas Patton



Honor Graduate
HM2 Michael Carpenter



Air Force SOF Medic of the Year Lt Col Patrick Pihana, SSgt Brent Scott, Col James Dougherty, AFSOC Command Surgeon, CMSgt Mike Ramos 23rd STS Superintendent

SOCM MEDIC PLEDGE

As a Special Operations Combat Medic, I pledge my honor and conscience to my country and the art of medicine.

I recognize the responsibility that may be placed upon me for the health and even the lives of others.

I confess the limitations of my skill and knowledge in caring for the sick and injured.

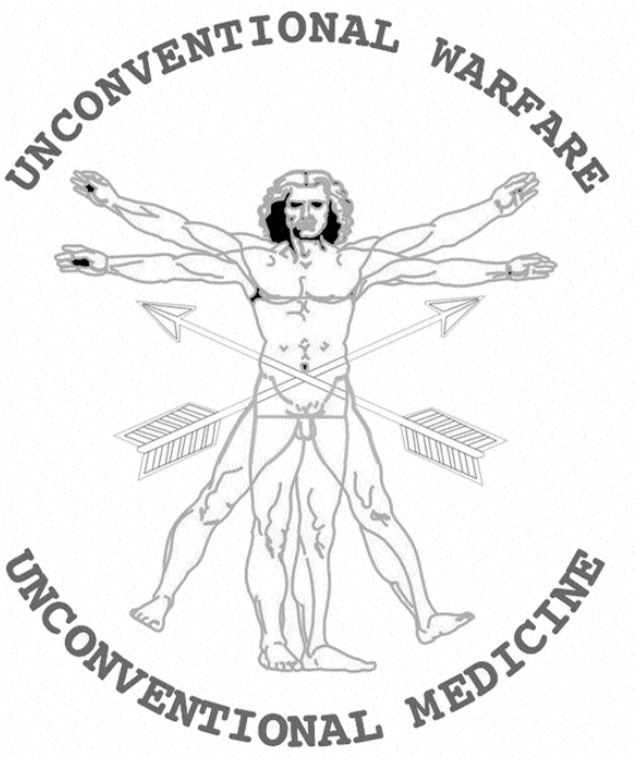
I promise to follow the maxim "Primum Non Nocere" (first do no harm) and seek the assistance of more qualified medical authority whenever available.

Those confidences that come to me in my attendance of the sick, I will treat as secret.

I resolve to continue to sustain and improve my medical capabilities throughout my career as a Special Operations Combat Medic.

As a Soldier/Sailor/Airman I will place all considerations of self below those of my team, my mission, and the cause of my country.

If you have suggestions, concerns, and/or recommendations for the JMEAC, pass them along to your SEMA and it will be addressed. But you have to…. "SEND IT"



COVER

Designed by MSgt McCumsey as the logo for the 2002 SOMA Challenge



The Journal of Special Operations Medicine is an authorized official quarterly publication of the United States Special Operations Command, MacDill Air Force Base, Florida. It is in no way associated with the civilian Special Operations Medical Association (SOMA). Our mission is to promote the professional development of Special Operations medical personnel by providing a forum for the examination of the latest advancements in medicine.

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From The Staff

There are important changes in the distribution of the Journal of Special Operations Medicine (JSOM) you need to be aware of. To assure the JSOM continues to be available to all who find value in it, we need to comply with the intent of the current distribution rules governing this publication.

Starting with this edition, we can, and will continue to send the JSOM to all our SOF units and the active editorial consultants without change. One of the new changes in SOMA membership is that you will now receive the JSOM as part of your membership. We strongly recommend this avenue, for SOMA has become a very valuable CME effort as well as an annual gathering of SOF medical folks to share issues. Please note, if you are a SOMA member and are not receiving the subscription, you can contact SOMA through www.soma.org.

For JSOM readers who do not meet the above criteria, we have arranged for the JSOM to be available as a paid subscription from the Superintendent of Documents, U.S. Government Printing Office, for only $30 a year. Thank you for understanding our need to change the distribution of the JSOM in order to be compliance with current distribution rules.

More big news!! As of 15 March, *WE ARE ONLINE*!!! Thanks to the cooperation and efforts of the Joint Special Operations University, the JSOM is now available online to all at http://www.hurlburt.af.mil/jsou. There are instructions on their homepage as to how to enter their medical link and access issues of the JSOM. You will also be able to take your CME tests online and a copy will automatically be sent to the JSOM email address for grading. And, if that's not enough... You can even link straight to the Government Printing Office to subscribe to the JSOM.

We are now in our ninth edition of the journal and continue to need your article submissions and photos. They are what keeps us going and they're what makes this journal so unique. It is a sharing of your lives and missions as you go forth as instruments of national foreign policy. We can't do it without your input; you are what the journal is all about!

The JSOM is one of the most excellent and righteous tools we have to span all the SOF services and to share medical information and experiences unique to this community. The JSOM survives because of generous but time-consuming contributions sent in by clinicians, researchers, and former medics from all the Services who were SOF-qualified and/or who served with SOF units. We need your help! Get published in a peer-review journal NOW! We are always looking for SOF-related articles from current and/or former SOF medical veterans. We need you to submit articles that deal with trauma, infectious disease processes and/or environment and wilderness medicine. We also need photos to accompany the articles or alone to be included in the photo gallery associated with medical guys and/or training. If you have contributions great or small… fire 'em our way. Our E-mail is: JSOM@socom.mil.

DON'T FORGET TO DO YOUR CMES!!!! The JSOM offers CMEs to our SF medics, PJs and SEAL corpsmen as well as physicians, PAs and nurses, in coordination with the Uniformed Services University of Health Sciences (USUHS). In this edition, you will find 1.0 CME offered on HEALTH ISSUES IN AFRICA:A GROWING SECURITY CONCERN.

Also in this edition of the JSOM, we honor our fallen brother, SFC Chris Speer, killed in support of Operation ENDURING FREEDOM .

Enjoy this edition of the journal, send us your feedback, and get those article submissions in to us!

mdd

Journal of Special Operations Medicine

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Colonel Hammer's military and medical career began in 1958 when he served as a U.S. Navy Combat Medical Corpsman attached to U.S. Marine Corps infantry, artillery, and communication/reconnaissance units. Following discharge, he completed his BS and MD degrees at the University of Michigan in 1967 and 1970, respectively. Following nine years of civilian medical practice in a multi-specialty group in Grand Rapids, Michigan, he reentered military service as a Flight Surgeon at Beale AFB, CA. In 1984, he completed the Air Force Residency in Aerospace Medicine at Brooks AFB, Texas, during which period he earned a Masters in Public Health Degree from Harvard University. Colonel Hammer has spent the majority of his career in aerospace medicine and direct line support assignments, has commanded three medical groups, and has been assigned to the ARRS/SG, the AFSOC/SG and the USAFA/SG. He is a chief flight surgeon and a master parachutist.

PRODUCTION EDITOR
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Maj DuGuay joined the Army Reserve in 1987 and served as a nurse in a Combat Support Hospital unit for three years before switching services in 1990 to become an Air Force C-130 Flight Nurse. She is currently an IMA reservist attached to the SOCOM/SG office. Maj DuGuay has a Bachelors in Nursing and a MBA/Management. Her career includes being a flight nurse in both the military and private sector, 15 years of critical care and emergency room nursing experience, an EMT and a legal nurse consultant. She also served as the military liaison to her Disaster Medical Assistance Team (DMAT.) Prior to the SG office, Maj DuGuay's experience at USSOCOM includes an assignment in the Center for Force Structure, Resources, Requirements, and Strategic Assessments.

Contents

Winter 2003 ***Volume 3, Edition 1***

Component Surgeon 9

Warner Farr, MD USASOC
Larry Garsha, MD NAVSPECWARCOM
Jim Dougherty, MD AFSOC

Medical Ops 14

LTC Ernest Nelon

Education and Training 15

SOMA Update
Dale Hamilton and MSG Mike Brochu

Research & Development 18

Mr. Bob Clayton, SVERDRUP

FEATURE ARTICLES

Health Issues In Africa: *A Growing Security Concern*--CME Article 20
Alan L. Hunt, Lt Col
Brian R. Madtes, Lt Col

Ergonomics in SOF Aviation 33
Frank Anders, MD

Diagnosis, Treatment, and Prevention of High-Altitude Illness 37
Ethan P. Carter, PhD
Peter H. Hackett, MD
Robert C. Roach, PhD

Special Ops Foot Care 46
Murray P. Hamlet, DVM

Preventive Medicine Interoperability, Joint Task Force -510, Operation Enduring Freedom - Philippines (OEF-P) 49
Derek Licina, CPT

CME Test Questions 56

Health Issues In Africa: *A Growing Security Concern*

Expedient Medic 60

***Ovine Polyvalent Immune Fab (CroFab)* --A New Tool**
Warner Anderson, MD

There I Was 61

For Pilots Shot Down Over North Vietnam, the Way Home Was Jolly and Green.
Robert A. Hanson

Legacy 67

Inside a Special Forces UNCONVENTIONAL WARFARE Clinic-Afghanistan
SFC Rojzet Von Stankavitch

Special Operations Related Reading List 72

Len Blessing

Correspondence ***Letters to the Editor & Apologies*** 75

Editorials 76

Corpus Cavernosum: An Alternative Route For Systemic Circulation Access
Melville Bradley, MD

Med Quiz 77

Arsen M. Pankovich, MD

Photo Gallery 82

Dedication 84

Christopher Speer, SFC



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3. Articles should be double-spaced, twelve point font, aligned on the left and justified on the right.

4. Important: Include an abstract, biography, and photo of yourself as part of the article.

5. Use of acronyms should be held to a minimum and when used they must be spelled out the first time.

6. Remember that your audience is inter-service, civilian, and international.

7. Every article has a point to make, which is traditionally stated in the introductory paragraph and restated in the closing or summary. Subtlety is not usually a virtue in a medical publication.

8. All references MUST be cited in the text and in numerical order. The references MUST be arranged in the order of appearance in the text. Give the full name of the journal. Use the following style of citation: author names, title of article: journal name, year, volume number, inclusive page numbers. If unsure, please contact us at JSOM@socom.mil.

9. Photographs with your article are highly encouraged. Photos must be sent separately from the document so they can be converted into a publishing format. Where possible, traditional ("hard copy") photos should be sent, however, scanned and digitized copies can be used but please make as large as possible, even if you have to send them one at a time. Every attempt to return your original pictures will be made, but the JSOM will not be held accountable for lost or damaged items.

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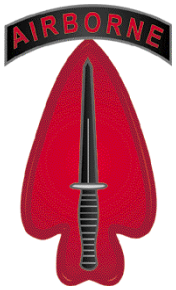
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12. Again, the JSOM is your journal. It is a unique chance for you to pass your legacy to the SOF medical community.

Take advantage of this opportunity.



USASOC





Rocky Farr, MD
COL, USA
Command Surgeon

I am writing this as I conduct personal winter warfare training in the mountains of western North Carolina over Christmas. About four hours and four days were as far as I though I ought to stray from Fort Bragg considering all that is going on in the world. Colonel Dalton Diamond is manning the office for me and I head back tomorrow to relieve him while he goes off for New Years in Alabama. We held an awards ceremony in front of the Colonel Bull Simon statue last week on Special Warfare Center's JFK Plaza and appropriately rewarded several officers and soldiers on my staff for their hard work. Such hard work is continuing over the holidays. As I check in by email daily, usually several times daily, I find many in the office on their supposed *reduced manning* schedule busily working issues for you in the field.

The command surgeon is getting plenty of *face time* with the general officers. Between anthrax immunizations already being back and smallpox looming, everybody wants to talk to the docs. The challenges of getting at least three doses of anthrax into soldiers before they launch is great, especially for our reserve component soldiers who we can only intermittently catch. At least smallpox is only one dose! Smallpox does take more explaining though, being a real infection with a different disease. I am old enough to have given many smallpox immunizations and received them too. The complications and secondary problems were never an issue. We will see this time around. Do ensure that soldiers receive the required briefings before they are dosed. My Chief of Preventive Medicine, Major Cajigal (cajigala@soc.mil), can help you.

Please keep up your great efforts to immunize the force and to report it in MEDPROS, whether influenza, anthrax, or smallpox. All eyes are on special operations and our ability to track immunizations and performance of deployed health care. Pre- and post-mission surveillance is being watch at all levels. I was in D.C. recently and visited the MODS contractor in Fairfax, Virginia, who runs the program. CSM Chad Hauser, Ret., an old SF guy, works for them. Always great to find low friends in high places. The Deputy Surgeon for USACAPOC, Major Dunn (dunnk@soc.mil) is the office expert on MODS, MEDPROS, FEDS_HEAL and in all things related to civil affairs and psychological operations.

We are still taking casualties regularly in OPERATION ENDURING FREEDOM. Casualty data and its flow is, as usual, problematic. The Army doctrine says that casualty tracking is a S-1, G-1, and/or DCSPER function. Sure! Half the time

I know nothing, the G-1 knows everything, and half the time it is the reverse. Anyone who thinks they have data that I ought to have please pass it to me or my Deputy Surgeon for Reserve Components/ Chief Nurse, Major Barber (barberc@soc.mil). Ric tries to keep up with all the injured folks. He is also great for TRICARE questions, especially about reservists on active duty.

Equipment issues, sets, kits, outfits, fielding, SOFSA, are all progressing. We have begun to put more and more items in SOFSA for specialized missions and uses. Class VIII downrange is still a battle, but we are making progress. We fielded new Medical Equipment Sets (MES) to several units and will field more in 2003. All equipment issues should be sent to the Chief of Medical Logistics, Major Sully (sullyh@soc.mil). He is a regular magic maker in the medical logistics arena. We are looking at new sets. Mr. Marak, Medical Requirements Specialist, (marakj@soc.mil) is the medical modernization officer on these issues. In addition, he is the guru on all new equipment. Joe also watches all medical research studies. Remember, no medical research without the Commanding General's approval.

Most all have heard that the NREMT-P requirement may change. The USSOCOM Surgeon, Colonel Hammer, will need to get General Holland's blessing but we feel confident that we can enact a newer, more relevant, standard, with less geriatric cardiology and more wartime medicine! Stay tuned for details. My Chief of Medical Training, Major Abner (abnerh@soc.mil) and his NCOIC, SFC Allen (allenbr@soc.mil) will stay on top of it.

We will have a USASOC Surgeons conference the Saturday and Sunday before the Special Operations Medical Association (SOMA) conference next year (2003), war and deployments willing. We could not have one in 2002 because SOMA fell the week after Thanksgiving. SOMA 2002 was a very good conference, with many great *no shit, there I was*… accounts presented by noncommissioned officers who were there. I urge you to attend in 2003.

There will be more than an average turnover in medical officers and physician assistants summer of 2003. I also have permission to assign Physical Therapy Officers to each Special Forces Group in the summer 2003. So, all you old broke guys can finally get some help. I have gotten several new medical officer slots for the 160th SOAR(A) and the SOSCOM. LTC Dakin (dakinp@soc.mil) is handling assignments for me, with plenty of advice from CPT Varos (varosd@soc.mil) on Aeromedical Physician Assistants.

Medical operations are going full blast with my medical operations staff routinely involved with geographic combatant commands and their medical planning staffs. Include USASOC med ops in your traffic. Chief, Medical Operations is LTC Smith (smithlo@soc.mil). Others include his deputy, LTC Newton (newtonf@soc.mil) and for USASFC, Major Canada (canadad@soc.mil) with Major Dunn (dunnk@soc.mil) for USACAPOC.

I am dusting off my desert BDUs just in case. Old soldiers at MACOMs do not get many opportunities to go forward like I did to Afghanistan, but I'm committed to supporting all of you with everything I can to help you succeed. Good luck and good hunting. (farrwa@soc.mil)

NAVSPECWARCOM



Larry Garsha, MD
CAPT, USN
Command Surgeon

Welcome Home! It's time to pack and head out! "It was the best of times, it was the worst of times."

Sound familiar? We have barely returned from OEF and now we are headed to CENTCOM.

The only easy day was yesterday….

It was an interesting yesterday. We saw the accomplishment of training in our Corpsmen pay off with their outstanding response to casualties in Afghanistan. We are still listening to stories of what went right and what we need to fix. Fluids, bandages, tourniquets, and splints became useful tools and not just *stuff* in the pack.

We remain very prideful of our dedicated NSW Corpsmen.

Navy Special Warfare Medical was busy in 2002:
- Rehab centers for each component commander
- Instruction for Independent Duty Corpsman
- Praise from the Navy Inspector General
- Completion of the USSOCOM 40-2
- Addition of physician assistant billets to Groups THREE and FOUR
- Addition of a physical therapist billet at the NSW Training Center
- Initiated quarterly medical enlisted advisory committees and continued quarterly Executive Committee Medical Staff meetings
- Initiated classified medical intelligence SITREPS
- Completed beta testing of Special Warfare Information Medical Program System (SWIMPS)
- Added 8404 corpsmen qualification for SWCCs
- Formally presented Navy Special Warfare High Risk Training Protocols for Recruit Training Healthcare symposium
- Completed skin cancer prevention, health promotion, and supplement instructions
- Participated in the pre and post deployment system
- Supported the High Speed Vessel testing,
- Hosted Congressional Staff for the House Armed Services Appropriations Committee
- Contributed to the development of the new shock mitigation seat for Mark Vs,
- Re-implemented anthrax immunizations
- Initiated the SSGN medical review board with Naval Bureau of Medicine, Naval Sea Systems Command (Diving), and the U S Marine Corp medical department.

Whats on the agenda for 2003?
- Implementation of SWIMS across the NSW board is on deck for launching
- Immunization for smallpox and collection of data necessary to support the program will be a major

activity

- An instruction for quality assurance for the rehab centers will be pursued
- Adding CBR instruction requirements for the com ponent groups
- Naval Special Warfare Information Management system requirement for documentation of qualifi cations for IDCs, 8492s, doctors and health pro fessionals.
- Development of a bridge program for Corpsman finishing their training and entering a platoon.

I am sure there will be much more.

Our Naval Special Warfare Medical Conference, February 13-16, will add substance to the accomplishments and help define future proposals. Those of you still in CONUS are encouraged to attend. We are going to start a tradition of remembrance for all NSW SEALS who are on their final patrol at our Medical Conference. Be there or be square.

And always, stay in touch with WARCOM Medical at (619) 437-0799, (619) 437-3069.

Hoo Yah!

AFSOC



James Dougherty, MD
Col, USAF
Command Surgeon

Due to current operational requirements and the AFSOC surgeon's inability to stay out of the operating room, we will defer input until the Spring Edition.



LTC Ernest Nelon

This winter has certainly been busy for all of us. Our SOF medics continue to sustain their high level of care and professionalism in a challenging operational environment. The SOF components efforts to train, maintain, and equip our medical forces for future requirements will be critical to our success in meeting near term future requirements. And finally, USSOCOM is preparing to assume expanded roles and functions in the ongoing Global War on Terrorism (GWOT).

First and foremost, we are all indebted to the SOF medics currently on the ground ensuring that our forces receive the very best initial combat medical care in the world today. The primary focus of all SOF medical staff officers/NCOs must always be to look for any opportunity to make it easier for these medics to do their job. While future funding increases to support SOF requirements will be significant, our ability to sustain our focus on the farthest forward SOF medic will continue to be critical.

As the GWOT drives multiple rotations of SOF and continuing preparations for future operations around the world, the ability of the SOF components to sustain their training and equipment requirements is extremely important. We must continue to maximize these opportunities to ensure that our SOF medics deploy as prepared as possible. The challenge of transitioning the responsibility for SOF medical requirements and operational control to the Theater Special Operations Command (TSOC) remains critical to avoiding seams in the overall SOF medical support plan.

The newest members of the SOF medical operations/plans community, the TSOC medical planners, are providing the required theater-specific focus to current SOF medical requirements and the GWOT. SOCCENT has maintained its level of responsibility as the SOF Component Command and has increased its medical operations/plans staffing to 3 officers headed by a O5 SOF Component Command Surgeon. The SOCEUR medical planner remains the most involved "supporting command" in support of SOCCENT requirements. The SOCJFCOM medical planner has supported a very aggressive JSOTF training schedule and assisted with multiple command and control training events. With each of the other TSOC medical planners also engaged in similar SOF medical requirements, GWOT efforts are truly global in scope and complexity.

Once our SOF medics deploy into a theater, it is critical that they understand how to get their medical requirements and issues to the right operational headquarters for action. In most cases, this will be at the TSOC. Any requirement or issue that doesn't go directly to the headquarters with both the responsibility and authority to take action will almost always take longer to get adequately addressed. Even if deploying SOF aren't working directly for a TSOC, the TSOC will almost always be the best advocate for SOF requirements given their existing direct relationship with the Theater Command Staff. We all need to do a better job of ensuring that our medical forces understand the best way to get their requirements and issues addressed once the deploy into a theater, before they leave home station.

Here at USSOCOM, we are all looking forward to receiving more definition and guidance concerning our future role and function as a potential "supported command" vs our previous role as "supporting command." In the next issue, I will discuss some of the expected resultant changes in the USSOCOM Surgeon's scope of responsibility associated with the expanded role and function of the headquarters.





Dale Hamilton
MSG Mike Brochu

SOMA Update

The Special Operations Medical Association's (SOMA) 2002 Conference was held 2-5 December. The total course attendance this year was 714, which represents an increase from the previous year. The total number of physicians was 237 and 427 non-physicians. The disposition of the various services attending is as follows: Army 221, Navy 75, Air Force 138, Reserve and National Guard 54, Civilians 120, Police and Firefighter EMTs 13, and NATO-allied forces 61. Among the countries represented were England, Germany, Norway, Netherlands, Singapore, Israel, Switzerland, Japan and Australia. Other agencies represented were the U S Coast Guard 13, ATF 6, USMC 1, and VA 12.

Based on a review of the critiques, the following recommendations are made for the year 2003 conference. The location and the hotel were outstanding, the Board of Directors has already approved returning to Tampa in 2003.

The "lessons learned" from Afghanistan were very popular. Many urged repeating this next year. The Operational Aeromedical Problems "OAP" course was also very popular and it was highly recommended that it also be repeated next year. Many appreciated the fact that OAP courses were open to audit for non-flight surgeons. The SOF-specific courses on the other hand were the most popular. Critiques were overwhelmingly in favor of our maintaining the focus on SOF issues regardless of whatever else the program contained. The international speakers were again a big asset to the program and their participation will certainly be encouraged in future years. Program time offered to the component surgeons for service-specific issues and the working lunches for the surgeons, was much appreciated and will be continued. Mess Night continues to be a very popular event, particularly since it encourages distinguished guests to mix and mingle. The pipe and drum corps continues to be very popular with everyone.

SOMA Challenge: The 2002 conference saw the first running of the SOMA Challenge. The Challenge is an operator focused sports event that included running (9 miles), kayaking (8K), and medical stations. There were four categories of competition: men, oldest, women, and team. This year the top winner in the men's category also tied as one of the oldest. This just proves that SOF warriors don't get older, they just keep getting better!

The winners of the first annual SOMA Challenge were:
Men: Louis Smith, PA; 2hrs 09mins; 42 points
Oldest: Gunner Fehn, Foreign physician; 3hrs 08mins; 46 points
Women: Gina Virgilio, Navy physician; 3hrs 11mins;40 points
Team: Rich Sumrall, Flight Surgeon and Paul Reitz, IDMT; 2hrs 29mins; 46 points

SOMA dates for 2003 are 6-12 December.

Military Familiarization Program

Through our association with USUHS, the SOCOM-SG is participating in the Military Familiarization Program outlined below and we hope to continue to draw interest in these medical students as they complete their medical training. By exposing them to the "real" issues facing our SOF operators, we have the opportunity to generate future SOF physicians, supporters, and advocates in the Army/Navy/USAF Medical Corps. Future support to SOF is important and we feel this program will generate interest in the future physicians dedicated to our care and missions. The following is a report by several of the students regarding their summer experiences in their respective training arena.

dhammer

This article was put together by LT Sarah Taylor, a medical student at the Uniformed Services University of Health Sciences (USHUHS), as an accumulation of the after action reports presented by ENS Samya Cruz, ENS Lori Sunamoto, ENS Brye Roberts, ENS Dana Onifer, Lt Richard Delaney, Lt Jacob Hogue, and Lt Suzanne Gillern.

What I Did on My Summer Vacation

Directly following the completion of the first year of medical school at USHUHS, all students are required to spend six to eight weeks in an operational setting. Students travel to bases all over the country, as well as Europe, to learn about the military and how various medical issues impact servicemen and women in their daily operations. This past summer, some of us were fortunate enough to visit various Special Operations Commands.

MS II student ENS Cruz spent a little more than two weeks with the staff in SOCOM SGs office at MacDill Air Force Base. Having had prior experience as a Naval Surface line officer deployed to the Persian Gulf, it was an interesting switch for her as she learned the medical support side of military operations. USUHS teaches its doctors to do "good medicine in bad places." At SOCOM in the SGs office a lot of that comes into action. Welcomed by Lt Col Lorraine, ENS Cruz was able to see first-hand what things the Surgeons Office was working on in support of the troops deployed in areas of conflict. Despite his busy schedule, Col Hammer, Command Surgeon, spent some time with ENS Cruz, talking to her about life as a military medical professional and the outstanding rewards of military medicine. ENS Cruz spent time all over the main halls of SOCOM where the medical team had a representative in every aspect of military operations. Mr. Bob Clayton showed ENS Cruz some of the latest equipment in buddy aid and emergency care capabilities for combat medics and she even got to see the initial implementation of the newest technology of handheld medicine for patient tracking. One cubicle across the way, sat the JSOM editor, Maj DuGuay, diligently at work on the latest edition of the JSOM. There is a lot of service-wide support and input that goes into the making of an excellent journal where teamwork and information flow comes together. ENS Cruz also spent some time in the SOCOM clinic in the MacDill AFB hospital. The whole staff at the SOCOM Surgeon Generals office was very enthusiastic about the work they were doing to provide training, equipment, and support to our troops deployed in harm's way. ENS Cruz felt privileged to have such a career enhancing experience in her training as a Navy doctor to one day support a joint forces military.

MS II student ENS Sunamoto spent three weeks with the Navy SEALs at Naval Special Warfare Group One. She divided her time between the training detachment (TRADET), the clinic for NSWG-1, and Naval Air Station, Nylund. Her work at TRADET was mostly administrative, i.e. scheduling training time for the SEALs to do maritime ops, demolition, etc.

ENS Roberts spent three weeks at the Armys Special Forces Underwater Operations School. Welcomed by MAJ Grady, Dive Medical Officer, she was given the opportunity to sit through the Dive Medical Technician (DMT) Course. This course is taught by a tri-service group of instructors and is just one of several taught at this facility. Other courses include the Combat Diver Qualification Course, Water Infiltration Course, and Dive Supervisor Course.

Students in the DMT course study the basic principles of hyperbaric chamber operations and proper use of the Navy dive tables. They also learn about various medical scenarios that can arise in a dive environment such as exceeding diving profiles, inadequate recompression procedures, and harmful encounters with sea flora and fauna, etc. Students also learn how to conduct thorough neurological exams, insert chest tubes, and start IVs. Chamber dives to 165 feet, a depth at which most divers experience nitrogen narcosis, demonstrated the difficulty of carrying out well-rehearsed tasks while treating patients at depth.

Culminating the training, ENS Roberts and the DMT students, as well as those in the Dive Supervisor Course, were subjected to various scenarios in which simulated patients were pulled from the water, diagnosed, and placed in the dive chamber for simulated treatment. These exercises helped consolidate the skills she and the students had learned during the previous weeks. By attending classes and participating in these exercises, ENS Roberts gained a better understanding of the challenges faced not only by the divers, but by those who care for them as well.

MS II ENS Onifer, a former Navy hospital corpsman with USMC Force Reconnaissance, chose to return to Camp Lejeune and spend the summer with the Marines who call Recon "home". He was joined by several other students without prior combat unit experience. They attended nautical navigation classes, working with young men who greatly impressed him with their intellectual abilities. After completing the classes and some boat training, they accompanied the Marines on a 50 nautical mile night

transit on the open ocean and through inland waterways, where these same Marines similarly impressed him with their stealth and operational expertise.

In the final exercise of the students' trip, they played adversaries to the platoon they had been training with during a simulated raid on a building. Not only did they get to see the lethal effectiveness of well-trained, disciplined, motivated troops, but they also noted how aggressively they led and followed commands to destroy an enemy as well as care for the wounded. As future physicians, ENS Onifer and his fellow students appreciated the opportunity to see and experience the hard work these men perform. They now understand the toll it takes on their bodies, as well as the mindset they possess which helps them overcome those tolls.

Finally, a group of four students and myself went to Fort Carson to work with 10th Special Forces Group. MAJ Durck, MD is the group's physician. He showed us around the local hospital and described the unique environment at 10th Group, as well as what type of medical care these soldiers require. We participated in a variety of activities, from a day of pre-scuba training to a day of weapons training on the M4 and sniper rifles to a day where we even got to fly in UH-60 Black Hawks. The pre-scuba was difficult and we all gained a new respect for the physical intensity of the training as well as an appreciation of the medical issues that can complicate these activities such as perforated eardrums, dehydration, and shallow water blackout.

We also had the opportunity to watch airborne soldiers jump from a C-130. Prior to watching the jump, we had a tour of the rigger shed to include gearing up for a combat jump. The heat and weight associated with all the gear, plus the decrease in maneuverability made us realize the extreme physical demands placed on today's soldiers.

Everyone at 10th Group was friendly and eager to share their time and knowledge with us. It was extremely beneficial to get such a hands-on look at the lives of Special Forces soldiers, and to learn how we may best care for them as future doctors.

I think that all the students who got to share in this SOF training experience would agree that no matter which command we individually visited this past summer, the experience was not only exciting and unique but an invaluable part of our medical education as we prepare to care for those in harm's way.



Bob Clayton, SVERDRUP

As December 2002 came to a close, several medical R&D items made their way to the top of the acquisition process. During one meeting in late November, I was asked by one of the senior medical non-commissioned officers, "Why does it take so *&%#@ long to get something into the field?" A good question and not an easy one to answer. I could easily answer the part about *&%#@, but that was not what the customer wanted to hear.

Most recently the Secretary of Defense directed a total makeover of the DoD acquisition process (there might be a Santa Claus after all, as this has been a sore point for most of my military and civilian career). Hopefully, this will all be sorted out in FY03. Until then, this might shed some light on the issue for those of you that are not totally familiar with the process. The DoD acquisition process has always been a very structured and lengthy one. In the acquisition business, all items must meet various degrees of specifications. I am sure that everyone has heard of the $600 commode seat and other horror stories. Well, for the most part these stories are true. Not only does an item have to meet a long list of Military Specifications (Mil Spec) but on the medical side they must also meet requirements or be approved by the Food and Drug Administration (FDA). The primary focus of the Mil Spec side of a program is whether or not a particular end item (e.g. weapon system, communications equipment) adheres to a set of standardized, operational parameters. These Mil Spec operational parameters include a number of factors that are taken into consideration when evaluating a particular item such as performance under varying operating environments (e.g. temperature, altitude, water resistance/proofing) and based on measurements of technical/engineering factors (e.g. low emissions, low probability of intercept/detection). In addition to meeting all these Mil Spec requirements, SOF operators also require that an item must be lightweight, user-friendly, able to be operated using night vision equipment, and be able to operate onboard aircraft, ground vehicles and ships. My point here is that it is next to impossible to run down to your local electronics suppler, hardware store, or pick up an item at a trade show (free…use it…you will like it) and expect it to meet all of the required operational requirements or Mil Specs.

Who really decides what the operational parameters are? Short answer… the operational Commanders. Who decides what the Mil Specs are? Engineers, scientists and acquisition professionals. Of course, most Mil Spec parameters were established long ago and still prevail. Once upon a time there was even a Mil Spec for a head of cabbage, but that is a different story. Who puts the operational requirement into a document to initiate the acquisition process? The Combat Developer. Once the requirement is approved and validated, funding is allocated. Remember, the Defense Budget is on a five year cycle, most commonly referred to as the Program Operating Memorandum or POM. As this article is being penned, the FY04-09 POM is being developed. A Program Manager (PM) is appointed and an Integrated Process Team (IPT) is formed that usually consists of the PM and representatives from the operational community, training, logistics, system safety, operational test and evaluation, a reliability statistician, and others as needed. The mission of the IPT is to make sure that the system stays on track so that it fully meets all operational criteria, training requirements, logistical considerations, and associated program costs (to include sustainment) to make it viable when finally fielded.

Fact: The US Government is not in the manufacturing business. So, the PM must initiate a request to a contracting officer in order to solicit proposals. Industry then prepares offers or bids to undertake or develop the required systems. In most cases, industry is not just sitting there waiting for the government to send business their way. So engineers, designers, contract lawyers, and casts of others each contribute to the process of delivering a system. Mil Specs for an item or system sometimes create requirements for long lead items for procurement and for special engineering, tooling, and manufacturing processes. They can also require special in-plant testing procedures before the item or system is finally turned over to the military for further testing and acceptance.

Once the military tests and accepts the system, the manufacturer starts or ramps up production. Military personnel are trained and equipped based upon a priority list developed by the service if the item or system is a service-peculiar item or by the priorities established by the respective operational commander. Units of issue for the item or system are based upon a Basis of Issue Plan (BIOP). The BIOP equates to the total number of end items or systems allocated for each military user. The BOIP can be found in the Materiel Fielding Plan, or like document, and is based on the Operational Requirements Document (ORD). There are varying degrees of service use and standardization or type classification, and instead of elaborating on each of these, I would recommend that you contact your appropriate service logistics or supply system for further information or clarification.

What I have provided here is simply a real basic generic overview of a number of concepts and steps required in a typical acquisition of an item or system destined for military users. By no means does this constitute a complete and detailed look at the nuances and details of the exact process. My intent is to provide you with some insight into the process by briefly outlining the complexities that are encountered to ensure that an item or system is properly designed to ensure safety, reliability, durability, and acceptability so that it fully meets the stated operational requirements developed by the users. Remember that priorities can change rapidly, funding can be reallocated, and that operational needs, doctrine, and missions evolve as real-world events occur. All these can significantly impact the acquisition process. On top of this, technical challenges can also create delays in getting something out the door to support the operators.

There is no easy answer as to why it takes so long to get something into the field…into the hands of the operator. Remember also, that I did not even address the additional issues that are involved with getting an item through the FDA. Let's just say that, in most cases, it requires long periods of clinical trials that cost a lot of money.

Please, do not let the process get you down. Things are changing in the way we do business. If you experience a deficiency with a piece of equipment, or have an idea on how to improve a medical capability, pass it on to your Component Surgeon. They are there to help. We have made a lot of headway but will continue to challenge the acquisition process to get things as fast as possible into the hands of the users.

CE/CME ARTICLE

HEALTH ISSUES IN AFRICA: A GROWING SECURITY CONCERN

Alan L. Hunt, Lt Col
Brian R. Madtes, Lt Col

ABSTRACT

The authors of this paper studied various subjects pertaining to the African continent over the past three months. The study culminated with a trip to three African countries: Angola, South Africa, and Nigeria. During this entire experience, these two authors specifically focused their efforts on health issues in Africa and the security concerns evolving from these issues. Their research identified six prevalent diseases--HIV/AIDS, tuberculosis, malaria, river blindness, cholera, and the Ebola virus found in African countries. Specifically, three diseases are causing the most havoc across the continent.

OBJECTIVES

1. Describe the diseases affecting sub-Saharan Africa.
2. State the reasons for the spread of HIV/AIDS in sub-Saharan Africa.
3. Comprehend US involvement in disease prevention in sub-Saharan Africa.

Complete Test on Page 56--Answer sheet on Page 58
Completion of this article and test offers 1.0 CME and 1.2 CNE/CEH.

DISCLOSURE: The presenters have indicated that, within the past two years, they have had no significant financial relationship with a commercial entity whose products/services are related to the subject matter of the topic they will be addressing or a commercial supporter of this educational activity.

Editor's Note: While the world's attention is currently gripped by events in other regions, Africa is in crisis with thousands of people dying silently each day. While exact figures of morbidity and mortality are difficult to gauge, all indications point towards nothing short of a decimation of populations in their most productive years, and the prospect of economic collapse and insecurity in the foreseeable future.

The concomitant collapse of health and social services considerably increases the death toll amongst those suffering from common and easily treated diseases like diarrhea, malaria, pneumonia and tuberculosis. The compounded impact of HIV/AIDS and mentioned factors is rapidly eroding the coping strategies used by communities to survive and destroying human capital necessary for the recovery from frequent drought and natural disasters. AIDS kills young adults, especially women, who are the backbone of their families and communities. It leaves behind orphans in large numbers with few prospects for a healthy future. Entire communities are collapsing under the strain of caring for the ill while maintaining productive livelihoods. Problems in governance, lack of appropriate agricultural policies and pervasiveness of poverty all contribute towards compounding the effects of the severe crisis.

The following essential elements must be pursued in tandem by the local, state, and global communities:

* Ensure the timely and effective delivery of adequate amounts of appropriate and nutritious food to identified vulnerable groups.
* Improve access to adequate amounts of safe drinking.
* Strengthen health services that tackle common illnesses including malaria, tuberculosis, and vaccine preventable diseases and provide comprehensive reproductive healthcare--including management of sexually-transmitted infections.
* Ensure equal access to health care and medicines.
* Provide means to prevent transmission of HIV, including trans-

mission from mother to child, by ensuring universal access to HIV/AIDS related information, testing and counseling, goods and services including male and female condoms, clean needles and gloves, safe blood transfusions and medicines.

* Protect women and young people against exploitation and sexual violence.
* Help communities cope with large numbers of chronically ill people, young people and those orphaned by disease through strengthening of social support and volunteer groups.
* Promote cost-effective and sustainable labor-saving agricultural practices.
* Incorporate HIV considerations into all sectoral responses to the crisis.

MAJ William M. Darby MPH, MEPM, REHS
Preventive Medicine Officer
US Special Operations Command -SG

Executive Summary

Descriptions and associated statistics of each disease are in the first section of this paper. Specifically, three diseases--HIV/AIDS, tuberculosis, and malaria are causing the most havoc across the continent. These diseases are most prevalent in the poverty-stricken areas of the continent and require much more resources and advancements in education, technology, and funding to prevent, control, and eradicate these conditions. African military members are receiving education and training to help curb the infection and spread of these diseases. While this is somewhat helpful, too many military members become infected during deployments. As African nations, the US, and other countries become more involved in peacekeeping operations in Africa, the concern over health-related security issues rise to the surface. These troops are very mobile and therefore are more susceptible to obtaining and spreading diseases. While HIV/AIDS has already made its way to the US, it would not be surprising if tuberculosis and malaria followed which would be devastating, especially if a new strain appeared that is unaffected by current medications. Many nations and NGOs are contributing to the effort to turn this health issue around but much more is needed. Even if money was not a factor, it will take years to eradicate these diseases. Corrupt political leadership is another area that contributes to the security concerns associated with these health issues. As these leaders hoard money for themselves and others in high government positions the diseases continue to run rampant. Also, numerous countries in Africa contain prime real estate to house terrorists and their organizations. EUCOM needs to keep a watchful eye on African countries until these governments improve sanitary conditions, educate their people in the prevention and cure of disease, build infrastructure in their country, and appropriately use their funds. Otherwise, the spread of these infectious diseases will grow to unprecedented levels, creating an unbearable security issue.

Introduction

Health issues in Africa are becoming a growing security concern to US national interests, especially in light of the recent terrorist attacks on 11 September 2001. While Africa currently may not be considered a vital interest in US national security strategy, it has the potential to evolve into one. Unless drastic measures are taken to control health related problems on the continent, Africa will become a ripe opportunity for providing a safe haven for terrorists that threaten America's homeland and security. Furthermore, the potential for diseases to spread outside of Africa is becoming increasingly greater as military involvement (from numerous countries) in peacekeeping and humanitarian operations as well as training exercises with African nations continues.

Health problems continue to exist and grow in many countries on the continent, despite education and intervention efforts from the US government and many other non-government organizations (NGO). Corrupt governments and poor leadership in African countries give rise to poverty, illiteracy, and substandard sanitary conditions. Moreover, a lack of funding from African governments and insufficient amounts of financial aid from external sources to treat and prevent health problems exacerbates the issue. In addition, African government officials and foreign business investors fail to build adequate levels of infrastructure necessary to provide or improve upon substandard living conditions that are major contributors to this situation. Finally, African culture and religious beliefs create barriers to solving health-related issues.

To date, efforts to address health issues have only scratched the surface and appear to be little more than superficial levels of involvement. While the subject has received much attention, the results of efforts to improve the situation have not achieved desired outcomes. The growth of democracy is in jeopardy and developing countries may fall prey to countries such as China if the current levels of engagement are not stepped up significantly. The future of Africa depends on the ability of the aforementioned actors to turn around the bleak outlook

into the 21st century and beyond. Otherwise, the continent is doomed to implode.

The effects of corrupt governments, poor leadership, minimal education, marginal intervention, and inadequate funding efforts have contributed to the six biggest health problems in Africa including HIV/AIDS, tuberculosis, malaria, river blindness, cholera, and Ebola virus especially in the southern regions of the continent. All of these diseases are preventable and most are treatable with medicine. Research on vaccines and treatments for HIV/AIDS continues to show promise, but the drugs are expensive and beyond the means for those infected. Unless a major concerted effort is put forth now, the social well-being of African people and the stability of their governments are destined for gloom and failure.

DESCRIPTION OF DISEASES WITH SUPPORTING STATISTICS: HIV/AID

The Human Immuno-deficiency Virus (HIV) causes Acquired Immuno-deficiency Syndrome (AIDS). AIDS was first recognized in 1981 and is considered a major worldwide epidemic. In Africa, the virus has spread to pandemic levels. HIV leads to the destruction and/or functional impairment of CD4+ T cells of the immune system and prevents the body from fighting infections and certain types of cancers.[1] HIV is an unusual virus because a person can unknowingly be infected with it for many years as it gradually multiplies inside the body. It is visibly hard to detect without blood testing because the individual can appear to be perfectly healthy. Research has yet to confirm that everyone with HIV infection will get

ADULT HIV/AIDS STATISTICS (Table 1)

Country	Men (15-49)	Women (15-49)	Total number of Adults	Percentage of Adult population
Angola	68,000	82,000	150,000	2.78
Benin	30,000	37,000	67,000	2.45
Botswana1	30,000	150,000	280,000	35.80
Burkina Faso	150,000	180,000	330,000	6.44
Burundi	150,000	190,000	340,000	11.32
Cameroon	230,000	290,000	520,000	7.73
Central African Republic	100,000	130,000	230,000	13.84
Chad	39,000	49,000	88,000	2.69
Comoros	Unavailable	Unavailable	400	0.12
Congo	37,000	45,000	82,000	6.43
Cote d'Ivoire	330,000	400,000	730,000	10.76
Dem. Republic of Congo	500,000	600,000	1,100,000	5.07
Djibouti	16,000	19,000	35,000	11.75
Equatorial Guinea	440	560	1,000	0.51
Eritrea	Unavailable	Unavailable	49,000	2.87
Ethiopia	1,300,000	1,600,000	2,900,000	10.63
Gabon	10,000	12,000	22,000	4.16
Gambia	5,400	6,600	12,000	1.95
Ghana	150,000	180,000	330,000	3.60
Guinea	23,000	29,000	52,000	1.54
Guinea-Bissau	5,700	7,300	13,000	2.50
Kenya	900,000	1,100,000	2,000,000	13.95
Lesotho	110,000	130,000	240,000	23.57
Liberia	16,000	21,000	37,000	2.80
Madagascar	4,200	5,800	10,000	0.15
Malawi	340,000	420,000	760,000	15.96
Mali	44,000	53,000	97,000	2.03
Mauritania	2,800	3,500	6,300	0.52
Mauritius	Unavailable	Unavailable	500	0.08
Mozambique	470,000	630,000	1,100,000	13.22
Namibia	65,000	85,000	150,000	19.54
Niger	27,000	34,000	61,000	1.35
Nigeria	1,200,000	1,400,000	2,600,000	5.06
Rwanda	160,000	210,000	370,000	11.21

Country	Men (15-49)	Women (15-49)	Total number of Adults	Percentage of Adult population
Senegal	36,000	40,000	76,000	1.77
Sierra Leone	29,000	36,000	65,000	2.99
South Africa	1,800,000	2,300,000	4,100,000	19.94
Swaziland	53,000	67,000	120,000	25.25
Togo	54,000	66,000	120,000	5.98
Uganda	350,000	420,000	770,000	8.30
United Republic of Tanzania	530,000	670,000	1,200,000	8.09
Zambia	380,000	450,000	830,000	19.95
Zimbabwe	600,000	800,000	1,400,000	25.06
Total	**10,495,440**	**12,948,760**	**23,444,200**	**8**

Source/Note: The figures are the estimates at the end of 1999, published by UNAIDS in the "Report on the Global HIV/AIDS Epidemic June 2000." They include all people with HIV infection, whether or not they have developed symptoms of AIDS, alive at the end of 1999. The figures are estimates based on a number of different sources of information, rather than exact counts. Table is available at: http://www.hivafrica.org/hiv_aids_stats.html.

AIDS; however, evidence points to the fact that most people with HIV will likely develop serious problems with their health. The two most common forms of transmission of HIV are person-to-person transmission through blood or body fluid contact. Most people become infected through sexual intercourse or by sharing needles with infected people, particularly from drug abusers.[2] Since this epidemic began over 20 years ago, HIV/AIDS has been the leading cause of death in sub-Saharan Africa.[3] Across the countries of sub-Saharan Africa, a total of 23 million adults and children are estimated to be living with HIV or AIDS, approximately 8 percent of the total adult population.[4] (See Table 1). Over 200 children are born everyday with HIV.

TUBERCULOSIS

Tuberculosis (TB) is one of the oldest known diseases in the world and is most commonly found in areas associated with poverty, overcrowding, and malnutrition. It is caused by the bacteria *tubercle bacilli* and is spread by inhaling the bacteria from an infected person who sneezes or coughs. TB was nonexistent in Africa prior to the arrival of European settlers. Once the disease hit the continent, it spread rapidly as a result of Africans traveling from their work locations in the cities to their families in the rural parts of the continent. In South Africa, one out of every 200 people suffers from active tuberculosis.[5] Many people have dormant TB bacteria in their lungs, but active tuberculosis may not develop in a person until their immune system is affected, most commonly by stress, poor diet, substance abuse, or other illnesses. Pulmonary TB, tuberculosis of the lungs, is the most common form of the disease. Other parts of the body can be affected if the bloodstream carries TB from the lungs to those parts of the body.[6] The World Health Organization (WHO) and the Joint United Nations Programme on HIV/AIDS (UNAIDS) stated in April 2001 that TB cases in Africa will likely double over the next decade. Furthermore, they claimed there were nearly two million new TB cases in Africa in 1999, and experts estimate that the number of TB cases in Africa will reach 3.3 million by 2005.[7]

MALARIA

Malaria is caused by protozoans called plasmodia and is transmitted by the female Anopheles mosquito to humans via a mosquito bite. There are three stages to the life cycle of the plasmodium protozoan. The first stage occurs inside the mosquito where the plasmodia reproduce. The second stage occurs following a mosquito bite as the plasmodia travels to the liver, reproduces, and forms clumps of parasites. The third stage occurs when the plasmodia invades red blood cells and multiplies again. The life cycle repeats when a mosquito bites an infected person and the plasmodia enter the mosquito.[8] Malaria is a public health problem and is found in more than 90 countries throughout the world. Moreover, more than 90% of all malaria cases are in sub-Saharan Africa. Malaria exists mostly in poor, rural areas and is prominent during the rainy season when intense agriculture activity is occurring. Over the past 50 years, the geographical area affected by malaria has drastically reduced; however, control of malaria is again becoming an issue because a lack of funds hampers the efforts of numerous organizations. Today malaria kills "one child every 30 seconds…in absolute numbers, malaria kills 3,000 children every day under five years of age…[and] is par-

ticularly dangerous during pregnancy."[9] With 40 percent of the world's population living in malaria-affected areas, 300 million will suffer from acute malaria and 1 million will die--700,000 of those will be children under the age of five. Many children suffer two bouts of malaria each year.

Drugs are losing their effectiveness and malaria-stricken families spend one-quarter of their income on treatment. As a secondary effect, malaria-afflicted families can only harvest about 40 percent of the crops harvested by healthy families.[10]

Onchocerciasis (River Blindness)

Onchocerciasis, also known as river blindness, is a major public health problem in Africa. It is caused by a parasite, *Onchocerca volvulus*, which lives underneath human skin an average of 12 years and produces millions of microscopic embryos called microfilariae. As its name implies, onchocerciasis can cause serious visual impairment to include blindness, an intensely itching rash, wrinkling and depigmentation of the skin, and lymphadenitis--hanging groins and elephantiasis of the genitals. Microfilariae produced in one person are carried to another person via the female blackfly. After mating, the fly seeks a bloodmeal to mature her eggs. During this process, it may ingest microfilariae from a person previously infected with onchocerciasis and pass it to another person when it gets another bloodmeal.[11]

Onchocerciasis exists in 36 countries in Africa, the Arabian Peninsula, and the Americas. Out of 120 million people worldwide who are at risk of onchocerciasis, 96% are in Africa. Of the 36 countries where the disease is endemic, 30 are in sub-Saharan Africa. A total of 18 million people are infected with the disease and have dermal microfilariae, 99% of whom are in Africa. Of those infected with the disease, over 6.5 million suffer from severe itching or dermatitis and 270,000 are blind.[12]

Cholera

Cholera is an "acute infectious disease caused by strains of the bacterium *Vibrio cholerae*. The bacteria, which are found in fecal-contaminated food and water and in raw or undercooked seafood, produce a toxin that affects the intestines causing diarrhea, vomiting, and severe fluid and electrolyte loss. Overwhelming dehydration is the outstanding characteristic of the disease and is the main cause of death. Cholera has a short incubation period lasting two or three days and runs a quick course. In untreated cases, the death rate is high, averaging 50% and as high as 90% in epidemics. With effective treatment, the death rate is less than 1%."[13]

In 2001, cholera outbreaks occurred in Ghana, Togo, Benin, Burkina Faso, Cõte d'Ivoire, and Niger. Between 14 July and 4 September 2001, there were 55 cases of cholera reported in Burkina Faso, three of which resulted in death. As of 12 August 2001, Cõte d'Ivoire reported 897 cases of cholera with 47 deaths. From 27 August to 2 September 2001, 13 cases of cholera were reported in Niger, which caused three deaths.[14] While cholera has been rare in industrialized nations for the past 100 years, the disease is still common today in sub-Saharan Africa. The cholera epidemic in Africa has lasted more than 20 years.[15]

Adequate sanitation is the key to controlling this epidemic. Where it is not adequate, an epidemic is hard to stop and could continue for quite some time. Proper water treatment is also necessary to prevent future outbreaks of cholera.

Ebola Virus

The Ebola virus has been responsible for numerous deadly outbreaks of disease in Africa since it first occurred in the Ebola River in northern Congo in 1976. The virus causes Ebola hemorrhagic fever, characterized by headache, diarrhea, vomiting, and massive internal bleeding (organ necrosis) in human beings and monkeys. The virus is thought to be spread by contact with blood or other bodily fluids of an infected person, body tissue, or unsterilized needles. Symptoms appear within 5 to 10 days of infection, and 80 to 90 percent of all infected people die by bleeding to death in a few days. There is no known cure or vaccine for the Ebola virus.[16]

Since the Ebola virus emerged in Africa during the mid-1970s, it has re-occurred sporadically. It is still unknown where the disease originates. There is no cure for the disease, which makes it difficult to predict where it will strike next. When it does strike, many people usually die.[17] Between June and November 1976, the Ebola virus infected 284 people in Sudan and caused 117 deaths. In Zaire, there were 318 cases and 280 deaths in a two-month span.[18] In 1995, 265 died in the Congolese town of Kikwit and in the Kasai Occidental province.[19] Ebola killed 45 people in 1996-97 in Ogooue, Ivindo and 224 people died of it in Uganda in 2000.[20]

Implications

The three major health problems--HIV/AIDS, tuberculosis, and malaria are having

adverse affects on the continent of Africa. The security implications are tremendous to not only Africans the but to the US and the rest of the world. Military, transient workers, and prostitutes pose the greatest threat to transmitting the diseases; however, the military appears to be most likely to transmit them beyond the continent due to their involvement with multinational troops in various humanitarian and peacekeeping operations. It is very possible for any of these diseases to reach epidemic proportions if prevention measures are not increased dramatically. Although US military personnel are immunized or take prevention medicines before deployments, there is growing concern that some of the diseases are developing new strains that do not currently have a cure.

The people in Africa are caught in a vicious circle. Ongoing ill health is one of the main reasons why the poor stay poor -- infections lead to poverty and poverty leads to infections. For every person who dies, many others live on but are reduced to poverty. Their health and their lives are affected by frequent bouts of illnesses.[21] Without massive education and intervention between now and 2020, AIDS will cause more deaths than any other disease epidemic in history. Furthermore, nearly one billion people will become infected with TB and 35 million will die from it. In addition, at least one million people a year, mostly children under the age of five and pregnant women, will die from malaria across the globe (see Table 2).[22]

Table 2
HIV/AIDS, Tuberculosis and Malaria: The Basic Facts, 2000

Disease	Deaths per year	New cases per year	Percentage in developing countries
HIV/AIDS	3 million	5.3 million	92%
Tuberculosis	1.9 million	8.8 million	84%
Malaria	More than 1 million	300 million	nearly 100%

Source: "Scaling Up the Response to Infectious Diseases: A Way Out of Poverty," *World Health Organization Report on Infectious Diseases*

Education and technology are available to prevent or cure most of these health related problems and diseases; however, the increasing trends will continue in Africa unless significant additional funding is made available. Donor countries are currently providing about $120 million per year to combat malaria, but it will take $1 billion a year to begin to control it. A recent study by Harvard University shows that during the year 2000, $2.5 billion in treatment costs and lost production was attributed to malaria. This figure does not include opportunity costs of missed schooling, lack of investment by foreign corporations, and lower tourism.[23] Without extensive improvements in these areas, the recovery of the African continent will be nearly impossible. The total spent on HIV prevention in sub-Saharan Africa (excluding South Africa) last year was $165 million from all sources. Current estimates now suggest that sums in the order of $2.5 billion are needed for prevention alone. Add the costs of care and the figure rises dramatically.[24]

The economic impact caused by these three major health related issues poses a serious security threat to the continent. Africa's GDP would be up to $100 billion greater if malaria had been eliminated years ago. But the pay-off could be as much as $3-12 billion a year in terms of a boost to the combined GDP of countries in sub-Saharan Africa. In the case of TB, $1 billion spent on drugs could mean that 70% of new cases could be treated, resulting in a 50% reduction in mortality over the next 5 years. HIV/AIDS also plays a detrimental role in economic well-being. According to the World Health Organization, a nation can expect a decline in GDP of 1% per year when more than 20% of the adult population is infected with HIV.[25] AIDS is being attributed for declines in agricultural production in some countries.[26] With regard to malaria, it is estimated that $1 billion a year is required to make a real difference.[27] Onchocerciasis also poses a serious obstacle to the socio-economic development in Africa.[28] Health providers are ill equipped to prevent, diagnosis, and treat affected people.

Experts relate the severity of the African AIDS epidemic to the region's poverty. Poverty drives many men to become migrant workers in urban areas, where they may have multiple sex partners. It also leads many women to become prostitutes, thus vastly increasing their risk of infection.

Religious and cultural beliefs also play a major role in preventing the spread of HIV. The Catholic church will not endorse the use of condoms by its followers. In addition, polygamy is practiced in some cultures and leads to increased spread of the virus. Many of the people who test positive for HIV

keep it to themselves for fear of becoming a social outcast or being judged immoral.

AIDS is having severe social and economic consequences, depriving Africa of skilled workers and teachers while reducing life expectancy by decades in some countries. The number of African children orphaned by AIDS since the epidemic began totals 12.1 million. Currently, 6.5 million AIDS contaminated orphans are living in Africa. Because of their disease, they face increased risk of malnutrition and reduced prospects for education.[29]

WHAT IS BEING DONE TO SOLVE THE PROBLEM?

Much has been done to address health-related issues in sub-Saharan Africa, but there is still a long way to go. The impact of AIDS in African militaries and in the communities has had an adverse impact, and it threatens the economy of the most attractive and promising country in Africa--South Africa. While some countries have realized success through various education and prevention efforts, many more still have a lot of work to do. The next section addresses some of the work in progress by sub-Saharan African countries, the US, and others to include NGOs.

ACTIONS TAKEN BY SUB-SAHARAN AFRICAN COUNTRIES

As the number of Africans infected with HIV/AIDS increases, TB cases also continue to rise. According to the South African National Tuberculosis Association, nearly half of all patients with TB are infected with HIV.[30] With the help of volunteer healers, the Department of Health and the South African National Tuberculosis Association is implementing a strategy called the Directly Observed Treatment Shortcourse (DOTS). It begins with and relies on testing, monitoring an uninterrupted supply of medicine, and ensuring patients complete a six-month course of treatment. The strategy achieved a 95 percent cure rate in other parts of the world and volunteers are working hard to reduce TB in Africa.[31]

The South African Department of Defence (SA DoD) has begun placing greater emphasis on educating military personnel on HIV/AIDS prevention. They have published and disseminated brochures and pamphlets to all branches of the armed services. In addition, they have instituted local programs in a classroom setting taught by military personnel. As part of this effort, the SA DoD has instituted policies focusing on the prevention of discrimination and victimization as well as the care and support of those infected and affected. They envision that the policy of the DoD addresses all the areas necessary to effectively manage HIV in the workplace, reduce the transmission of HIV, prevent discrimination, and provide appropriate care and support. The SA DoD states the successful execution of the policy lies in the hands of every member of the DoD so that they can collectively put into action measures that may turn the tide on one of the greatest threats that humankind has ever faced.[32]

According to senior leaders in the South African Navy at Simons Town, the military is largely susceptible to contracting HIV because they are "very mobile." In an effort to educate their personnel, the Navy fleet headquarters recently initiated a campaign/contest to involve their troops in an AIDS awareness and education program. It was a huge success and units in the fleet embraced it with much enthusiasm. Numerous interviews with Navy personnel at Simons Town supported the senior leaders' statements.

The South African Defense Council within the Parliament stated there was emphasis on partnership and open dialogue to educate personnel within the military. They also acknowledged HIV/AIDS was an important issue and stressed the importance of involving African nations in research and development efforts. The Defense Council questioned who got the benefit of research, how it was conducted, and what happened after the research is done. Their bottom line was that the US would not have success in helping to combat the spread of HIV without the South Africans leading the way in a partnership in research and development.

According to sources at the US embassy in South Africa, one billion rand (equivalent of approximately 91 million US dollars) is being added to the four billion rand already budgeted to be spent on AIDS-related illness to include a "progressive roll-out" of the mother to child transmission (MTCT) program. Additional money is provided for infrastructure, training, and redistribution of advanced hospital services to poorer regions. Gauteng Premier Shilowa announced that his province will begin prescribing nevirapine, counseling, and other measures to prevent MTCT of HIV/AIDS at all public hospitals and large community health centers over the next year.[33]

As part of a joint effort between the US Navy led program called the Life Initiative and South Africa, a comprehensive plan was created to address

HIV/AIDS in the South African National Defence Force (SANDF). Specific components of the plan included creating a sustained HIV/AIDS in-the-workplace program in every unit in the SANDF, a provision for distributing condoms, peer education, and an educational program emphasizing general awareness of HIV and sexually transmitted infection prevention as well as occupational transmission of HIV prevention. The plan also incorporates a system for monitoring and evaluating programs aimed at HIV prevention. Key indicators identified for monitoring include evaluation measures of all aspects of training, performing a baseline Knowledge, Attitudes, and Practice (KAP) study, and establishing baseline epidemiological parameters. [34]

Another part of this effort involves creating a media program called Beyond Awareness Campaign. This four phase educational campaign is designed to change behaviors of military personnel over the course of a year. The addition of computer equipment will enable units to expand upon the information provided through Internet and other means.[35]

The third part of this effort resulted in development of a comprehensive training program to train regional master trainers and HIV educational officers. In addition, all South African Medical Health Service (SAMHS) personnel will be trained to provide standardized HIV counseling and treatment for military members and their families. Finally, peer group educators will be trained to provide education and to support HIV workplace programs.[36]

The Lesotho Defense Force also developed an HIV prevention program in 2001. Their timeline for implementation encompasses 18 months and it spells out in detail the goals on a quarter-by-quarter basis.[37] They also developed a strategic direction for HIV/AIDS prevention in the Lesotho Defense Force and received funding from the DoD HIV/AIDS prevention program to implement their program.[38] Military hospitals have begun to educate civilians on HIV prevention and behavioral change in military population. The Makoanyane Military Hospital in Lesotho teaches a one-week long program for military personnel in their region.[39] The program is very comprehensive and involves classroom teaching and role-playing at a very elementary level to ensure everyone understands the causes and means for HIV prevention.

The Center for Disease Control (CDC) South Africa provided technical assistance to develop counseling guidelines to provinces in South Africa. In cooperation with the Department of Health's (DOH's) Preventing Mother-to-Child HIV Transmission Program (PMTCT), they provide guidance to implement the PMTCT program and facilitate monitoring, evaluation, and research. Voluntary counseling and HIV testing (VCT) is a cornerstone of the PMTCT program. CDC South Africa has provided funding to the DOH for the following: 1) to develop and print the National Programme for the Prevention of Mother to Child Transmission of HIV Training Guide; 2) to develop a video explaining the PMTCT program to pregnant women attending the training sites; 3) to develop and print the VCT guidelines Minimum Standards for Counseling and Training, and Train the Counselor Trainer Workshop; 4) for DOH staff to attend workshops on laboratory proficiency testing and "rapid" HIV test evaluations, and; 5) to train "master" counselors and counselor training.[40]

US Involvement

US concern over AIDS in Africa grew during the 1980s, as the severity of the epidemic became apparent. According to the US Agency for International Development, the United States has been the global leader in the international response to AIDS since 1986. Legislation enacted during the 106th Congress increased HIV/AIDS funding worldwide and supported several African AIDS initiatives. In the 107th Congress, FY2002 appropriation legislation continued this trend. On May 11, 2001, President Bush pledged $200 million to a new global AIDS, malaria, and tuberculosis fund.[41] One month prior, President Bush named Scott Evertz the Director of the White House Office of National AIDS Policy (ONAP). The president expanded Evertz's mandate to include the international and national security aspects of the pandemic, and coordination of international and domestic policy relating to US efforts to combat the disease abroad. In May, President Bush established a Presidential Task Force to ensure the most effective response by the US to the growing threat of the global HIV/AIDS pandemic. The task force is co-chaired by Secretary of State Powell and the Secretary of Health and Human Services Thompson, and it includes high-level representatives from all major foreign and domestic affairs agencies. The task force expects to forge new domestic partnerships to work with international partners on this issue.[42]

In an interview with a senior US State Department official, the individual stated the Center

for Disease Control (CDC) and the US DoD for Life Organization would require a permanent presence to turn around the growing pandemic. The official also confirmed the need to unify leaders at all levels in an effort to develop policies and programs necessary for success.

In recognition of the growing challenge in spurring action against HIV/AIDS and other major diseases, the US State Department created the Office of International Health Affairs (IHA) within the Bureau of Oceans, International Environmental, and Scientific Affairs. The new office, building upon the previous Office of Emerging Infectious Diseases, is the State Department's focal point for global health affairs -- linking and coordinating actions by governments, NGOs, private companies, and health communities.[43]

The State Department realizes that resources are vital in building public health infrastructure and providing essential resources to people living with HIV/AIDS. They are leading negotiations to create a new global fund that would attract, manage, and disburse additional resources through a public-private partnership in an effort to make a sustainable and significant contribution to the reduction of infections, illness, and death caused by AIDS, TB, and malaria.[44]

In recognition of the importance of averting the HIV/AIDS pandemic in sizable strategic regions such as Asia, IHA awarded a grant to the University of Washington that will help establish a "network of networks" in regional disease surveillance against HIV/AIDS in Asia.[45]

The State Department assured the inclusion of health discussions in high-level diplomatic venues such as the European Union and G-8 summits, and they have actively participated in meetings of the UN General Assembly's Special Session on HIV/AIDS, the Association of South-East Asian Nations (ASEAN), the Southern African Development Community (SADC), and many others. By making a strong case to national governments and social leaders that the fight against HIV/AIDS is in their national interest, the State Department coerces leaders to take action and make compelling choices in support of their national health policies. They believe that political commitment at the highest level of government and throughout the nation's societal institutions makes the difference in halting the epidemic.[46]

The State Department sponsored chiefs-of-mission conferences focused on HIV/AIDS in Africa in Zimbabwe and Kenya. They also promised to plan additional conferences in the near future in regions where the epidemic is a prime candidate to worsen. The department will continue to play an increasingly important role in preventing and controlling the HIV/AIDS problem for many years to come.[47]

The Office of the Undersecretary of Defense for Policy, International Security Affairs, Office of African Affairs is the focal point for US policy for sub-Saharan Africa. Their mission is to develop, recommend, integrate, and execute current and future policies, strategies, and programs that support US national security interests in sub-Saharan Africa. One of the DoD programs they monitor is the HIV/AIDS Training and Education Program for Africa. This program helps African militaries design and conduct campaigns to reduce the spread of HIV/AIDS in 14 African countries.[48]

Under the direction of the US Navy, the DoD HIV/AIDS Prevention Program was started to reduce the incidence of HIV/AIDS among military personnel in selected African nations.[49] Program staff visited South Africa five times since September 2000. During their first visit, representatives from DASD Policy/African Affairs and EUCOM J-4 Medical initiated an in-country assessment and collaborated with the South African Medical Health Service (SAMHS). One of the key outcomes resulting from initial meetings was a strategic decision by the SAMHS Surgeon General to establish a multidisciplinary HIV/AIDS Advisory Council to enhance and broaden HIV prevention efforts. In January 2001, program staff met with the South African HIV/AIDS Advisory Council to discuss and establish elements of their operational plan for HIV prevention. The meeting established a name for the program (MASIBAMBISANE) and set a media launch date. During this meeting, the participants established the role of outside agencies in the campaign, created a plan to ensure Internet access, and developed a framework for program monitoring and evaluation. In May 2001, personnel from the program staff and SAMHS developed formal procedures for the purchase of audiovisual equipment, finalized the budget for the entire collaborative effort, and established procedures for approval of funding requests. They also reviewed the plans for the media event to kick off the SAMHS HIV/AIDS prevention plan. In August 2001, the groups met to establish procedures to begin implementing regional programs.[50]

In addition to funding assistance for the MASIBAMBISANE campaign, the program provided funding for two staff positions in Pretoria to assist

the SANDF HIV/AIDS prevention program. It also provides funding for the SANDF program manager to attend the American Public Health Association annual meeting and the Infectious Diseases Society of America meetings in October 2001. Most recently, the program funded trips for two key personnel in the SAMHS to participate in a meeting sponsored by Family Health International in Ghana. During this trip, a meeting to develop a comprehensive package on HIV/AIDS for uniformed services in Africa initiated development of programs for basic and in-service training and peer education as well as monitoring and evaluation procedures through a consensus process among the multidisciplinary and multinational participants.[51]

CONTRIBUTIONS OF OTHERS

Donor governments, non-governmental organizations, and African governments have responded primarily by attempting to reduce the number of new HIV infections, and by trying to ameliorate the damage done by AIDS to families, societies, and economies. The adequacy of this response is the subject of much debate. Spending from all sources on HIV/AIDS in sub-Saharan Africa was estimated at $500 million in FY2000.[52]

The World Health Organization has been the greatest contributor of time and resources to combat health related issues around the world. Their efforts have led to successes in many parts of the world; however, the lack of adequate funds and support from government leadership has stymied their overall effectiveness. Their plan of attack for combating health-related issues is sound, but it requires more than they are capable of producing due to the aforementioned reasons.

Recently, the Bill & Melinda Gates Foundation and The Carter Center made a major contribution to combat HIV/AIDS in Africa. Bill Gates, the richest man in the world, and his wife Melinda have established the largest foundation in history with a $24 billion endowment. The money is helping to spotlight global health problems, a top priority the AIDS crisis.[53]

In an interview on 24 February 2002, Bill Gates said,

> Stopping the transmission of HIV is the foundation's number one global health priority. We know that strategies including prevention, education, and outreach to those most at risk of contracting and spreading HIV/AIDS can effectively arrest the spread of the pandemic. More than 40 million people are living with HIV/AIDS, a disease that is devastating to families, communities, and national economies in Africa, Asia and around the world. Governments in both the developing and the developed world need to step up their investment in a dramatic way.[54]

Multinational corporations are also supporting efforts to reduce HIV/AIDS. "In the wake of the recent International Conference on AIDS, the Bill & Melinda Gates Foundation, Merck & Co., Inc. and the Republic of Botswana announced the establishment of the Botswana Comprehensive HIV/AIDS Partnership. The goal of the initiative is to improve the overall state of HIV/AIDS care and treatment in Botswana. In collaboration with the government of Botswana and with an intensive commitment of resources, the Botswana Comprehensive HIV/AIDS Partnership will work to 'advance significantly HIV/AIDS prevention, healthcare access, patient management and treatment of HIV in Botswana, a country where an estimated 29 percent of the adult population is HIV-positive.' The Gates Foundation will dedicate $50 million over five years to help Botswana fundamentally strengthen its primary health care system. Merck and the Merck Company Foundation will provide matching funds for the development and management of the program and the contribution of antiretroviral medicines. The goal of this model program is to demonstrate the benefits of utilizing a comprehensive approach to improving the care of people living with HIV in a resource-constrained country."[55]

During the World Economic Forum in Switzerland in January 2000, Raymond Gilmartin, President and CEO of Merck, delivered an address that solidifies the importance of collaboration between governments, NGOs, and multinational corporations. He said,

> The Global Alliance for Vaccines and Immunization - with the Gates Foundation's commitment and the collaboration of the Rockefeller Foundation and other foundations, governments, the health care industry, and non-governmental and international organizations including the WHO, the World Bank, and UNICEF - can make a tremendous impact on global health. The kind of cooperation GAVI represents will be essential for improving access to better health care and medicines for people throughout the world.
>
> Our experience with the medicine Mectizan, which treats and prevents river blindness and lymphatic filariasis, has taught us that even the simplest pharmaceutical intervention faces tremendous challenges in delivery. This medicine has no special storage requirements, requires minimal medical supervision, and is taken

as one tablet just once a year. Recognizing that the hundreds of millions of people at risk for these devastating diseases could not afford this medicine - no matter how little we charged for it, our company decided to donate it - for as long as necessary - to help eliminate the diseases as public health problems.

Yet even with the cost of the medicine removed as a barrier to access, it still took the collaborative efforts of the World Health Organization, the World Bank, the Carter Center, international aid agencies, non-governmental development organizations, national ministries of health, community health care workers, and Merck - several years to develop a protocol, an infrastructure, and a delivery system for Mectizan. The effort was worth it: the system reaches tens of millions each year with an effective therapy, and in so doing, has helped to improve primary health care in some of the poorest regions of Africa.[56]

THE ROAD AHEAD

Since 1991, US forces conducted over 25 contingency operations in sub-Saharan Africa. The Office of the Undersecretary of Defense for Policy, International Security Affairs, Office of African Affairs acknowledges that transnational threats are increasing in sub-Saharan Africa. Approximately 20 percent of US oil is imported from Africa and that number is expected to grow because of the oil's quality. From a political slant, the US has an interest in supporting emerging democracies in Africa. Furthermore, the US acknowledges the fact that Africa represents 26 percent of the United Nations.[57]

One of America's policy goals in Africa is to combat transnational security threats including terrorism, crime, disease, weapons proliferation, and environmental degradation.[58] In order to achieve these goals, a comprehensive plan must be developed and implemented that aligns with the proposed World Health Organization (WHO) campaign to attack the health-related problems in Africa. First, by targeting the major diseases in Africa, they can give direct help to the most vulnerable, particularly the poor, the young, and the weak. Second, by controlling AIDS, TB, and malaria, significant obstacles that keep people in poverty can be removed. Third, by controlling HIV/AIDS, TB, and malaria, families can be prevented from falling into poverty while decreasing business costs incurred through absenteeism, higher recruitment and training cost, and greater expenditure on medical care for employees. Fourth, the WHO can stop losing further ground against drug-resistance that threatens to undermine their limited armory of low-cost drugs for the effective treatment of TB and malaria. Fifth, the WHO can reduce risks of disease spread as a consequence of population mobility. Sixth, they can make progress against the most formidable childhood killers. Seventh, they can prevent HIV from engulfing Asia and Eastern Europe. Finally, they can strengthen health services by investing now in a concerted global effort against the three major diseases.[59]

In one African country, Nigeria, much has already been done in the battle against AIDS but much more is still needed. According to the 15 March 2002 edition of *The Guardian*, a Nigerian newspaper, the chairman of the National Action Committee on AIDS states, "$500 million has so far been spent in the battle against HIV/AIDS, while $226 million [is] still needed."[60] During the Carter and Gates visit to Nigeria, Bill and Melinda Gates donated $260,000 towards the fight against HIV/AIDS in Nigeria. However, Harvard Professor Jeffrey Sachs stated, "$1 billion is needed yearly to declare 'a total war for life' against HIV/AIDS in Nigeria."[61]

Curbing the runaway health issue in the African continent will not be accomplished in the near term. The road ahead has many challenges with funding probably being the most difficult hurdle to overcome. As noted earlier, estimates just for battling HIV/AIDS in one country vary by as much as three quarters of a billion dollars. To battle all of the health issues in Africa requires huge sums of money, which is not flowing freely at this time. The health issues described above will likely be prevalent for decades.

CONCLUSION

Government and non-government organizations need to build upon existing successes to turn the tide on health issues that pose security threats. Many countries are already taking effective action to curb the infectious diseases that cause and perpetuate poverty. Through committed political leadership, effective partnerships, and sound campaign strategies, progress is being made in some parts of the world against infectious diseases and other causes of death, disability, and suffering among infants, children, mothers, the military, and the rest of the civilian populace. For example, in Nepal, the DOTS strategy has been extended to 75%. This effort has prevented as many as 18,000 deaths attributed to TB in 1994 and 11,000 in 1999. In Peru, the results are similar, halving TB incidence between 1991 and 1999. In Vietnam, the death toll resulting from

malaria was reduced by 97% as a direct result of using insecticide-treated nets, indoor spraying of insecticides, and locally produced prevention drugs. In Uganda, where HIV infection rates were the highest in the world during the late 1980s, a comprehensive campaign with committed political leadership has led to a reduction of HIV prevalence by as much as 60% among pregnant women and even larger reductions among groups of young people in the 1990s.[62]

The strategies underlying these successes must be applied universally. Efforts must be increased to achieve the desired outcomes with a focus on reaching the poor as soon as possible. The key to implementing successful campaigns rests with political leadership and adequate funding to treat and prevent infectious diseases in an effort to control and eradicate them. Corrupt political leadership has caused nations to fall prey to infectious diseases because money that could have been used to develop infrastructure to improve sanitary conditions as well as education is not being spent in these areas. Funding from external sources can slow the spread of infectious diseases, but improvements in sanitary conditions and education are the cornerstones to control and eradication. Leadership in government is the enabler that must make this happen.

Africa poses unique challenges as newly formed democracies mature. In most cases, progress will take years of investment and dedicated leadership to positively affect change. Countries possessing natural resources must invest proceeds from their sales into their infrastructure, not into political leadership entities with self-serving causes.

Until world powers including governments, NGOs, and multinational corporations step forth in a concerted effort to prevent corrupt governments from destroying their countries, people around the world will continue to experience the wrath of their leaders. Furthermore, by not shaping the international environment, security concerns posed by terrorist groups and the spread of infectious diseases will grow to unprecedented levels.

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Ergonomics in SOF Aviation

Frank Anders MD

ABSTRACT

The advent of inflight helicopter refueling changed drastically the flight mission duration for Special Operations Aviation. The limiting factor is now the human element. Stoicism and improvision of flight crews have kept the short term spinal and extremity pain and possible long-term dysfunction attendant with multiple 8-10 hour flights unnoticed and unaddressed to date. This article is meant to reveal the difficult conditions under which these brave warriors continue to fight and stimulate those individuals in the Army and helicopter industry with the expertise to improve those conditions to do so.

After action review of the Desert One landing site disaster (American hostage rescue attempt in Iran) highlighted the need for aviation assets dedicated to special operations missions. As a direct result of this assessment, the 160th Special Operations Aviation Regiment (160th SOAR) was established in 1983.

The mission requirements of 160th SOAR are unique. They are fondly referred to as the "Night Stalkers" because literally all their operational missions are flown at night.

It was quickly recognized that these mission requirements required flight durations exceeding the design-standard fuel capacities of the Boeing CH-47 (Chinook) and Sikorsky UH-60 (Blackhawk) aircraft, so they were fitted with airborne refueling probes to enable inflight refueling and thus, longer mission flights.

However, once the fuel constraints were resolved, the human component became the limiting factor in mission length. Here in Kandahar, Afghanistan (where I write this article) I became concerned with the discomfort and resulting injuries and mission degradation. It is my intent to reveal the grueling conditions under which these men fight and thus evoke some thoughtful suggestions from the medical and engineering communities for ways to improve aircrew tolerance of their mission requirements. My primary concern for these very dedicated, stoic warriors is the toll these long missions take on their combat effectiveness as the flight progresses.

Due to the "high, hot and hell of a lot" environment of Afghanistan, the MH-47 "Hook" bears the lion's share of the missions, but the MH-60 "Hawk" plays a very important role when altitude, temperature, and load permit. They will be discussed separately.

The MH-47D pilot seats are of formed fiberglass with a steel seat-plate, have a fore/aft adjustment range of five inches in one inch increments, an up/down range of five inches in one-inch increments and fore/aft tilt of 3.5 inches with 1.5 inch increments. Some pilot seat back cushions have removable lumbar supports. The anti-torque pedals are adjustable fore/aft through a four-inch range with ¾ inch increments. There are seats available from the manufacturer for the crewmen of a standard configuration CH-47, but they are completely useless to the



MH-60 Pilot

160th crewmen because they are "hard" attached to the airframe, the forward stations facing aft and the aft stations facing inward.

The two forward stationed 160th combat crewmen man airframe-mounted 7.62mm Miniguns fired through the open upper half of the forward access doors. Their job in hostile territory is protecting the aircraft. They must face their gun ports because their area of responsibility is outside the aircraft.

The longitudinal axis of the Hook is relatively level in cruise flight. The MH-60L pilot seats are of formed fiberglass with a composite seat-plate, have a fore/aft adjustment range of five inches in one-inch increments, an up/down range of five inches in one-inch increments and no fore/aft tilt. Some pilot seat back cushions have removable lumbar supports. The anti-torque pedals are adjustable through a range of 6.5 inches with increments of choice.

The crewman seats are tubular aluminum with nylon web inserts, detachable and side-facing without adjustments. These seats have nylon strap lap and shoulder restraints on inertia reels.



MH-47 Forward Door

The longitudinal axis of the Hawk is tilted seven (7) degrees nose down in cruise flight. Neither the Hook nor the Hawk is climate controlled. All flight crewmembers wear Nomex™ flight suits with gloves and boots to protect against burns in case of on-board fire. My first mission, the outside air temperature when we landed back at Kandahar, an hour before dawn, was 38°C (100.4° F).

The combat gear worn by pilots and crewmen shown herein weighs an average of sixty (60) pounds exclusive of their CamelBak™ water supply and their personal shoulder fired weapon secured close at hand. The helmet with night vision goggles (NVGs) weighs 5.5 pounds.



MH-60 Pilot



MH-60 Crewman

The average age of the 3/160th pilots is 34 years. The average age of the crewmen is 26 years. The tallest pilot of the 3/160th is 6 feet 5 inches. The shortest is 5 feet 5 inches. The tallest crewman in the unit is 6 feet 2 inches. The shortest is 5 feet 6 inches. These skeletal ranges combined with the combat gear weight and mission lengths certainly create an ergonomic challenge.

The pilots and crewmen of both aircraft all report back and/or neck pain within one to two hours after take-off. Several of the crewmen report that their legs are "numb" within 30 minutes of take-off. The pilots have more comfortable seats but are unable to change positions even for a moment to relieve the strain. One tall, otherwise healthy pilot reported that after a five-hour mission it may take him about fifteen minutes to extract himself from the cockpit due to pain and stiffness.

The crewmen can relieve the strain with periodic postural changes but standing, even momentarily, greatly limits their view through their

gun portal of the ever-changing hostile terrain outside. The Hook crewmen, keenly resourceful, usually anchor two ammo cans, topped with a cushion, to the floor. There are, of course, no restraints for these homemade seats. The crewmen tether themselves to the floor of the aircraft with an eight-foot cargo strap to prevent ejection from the aircraft in the event of a crash or violent evasive maneuvers. The Hawk crewmen have to assume a serpentine posture to sit erect in compensation for the nose down attitude of the aircraft. This flight attitude also necessitates the pilots sitting with their buttocks on the forward lip of the seat in order to obtain erect posture. To maintain this position, their quadricep muscles are continuously flexed, with only the upper portion of the seat back contacting the cervico-thoracic spine. This attitude-compensating position often causes paresthesias and/or anesthesias in the lower extremities.

After several missions with these guys, I can personally attest to their superhuman stoicism.

My secondary concern as an orthopaedic surgeon of many years is the long-term outcomes, possibly including disability, that they may suffer as a result of enduring the arduous physical conditions imposed by many of these missions over prolonged periods. Clearly, neither the Army nor the aviation industry has effectively addressed the ergonomic challenges created by the technological advancements enabling long range SOF missions in these two aircraft.

My friend Frank Robinson, owner of The Robinson Helicopter, once gave me a quotable quote: "It's easy to design and build something complex and expensive that works well. It's difficult to make something simple and inexpensive that works well." But he did it. I hope the folks at Boeing and Sikorsky have the same capability, because our missions and our aircrew deserve it.

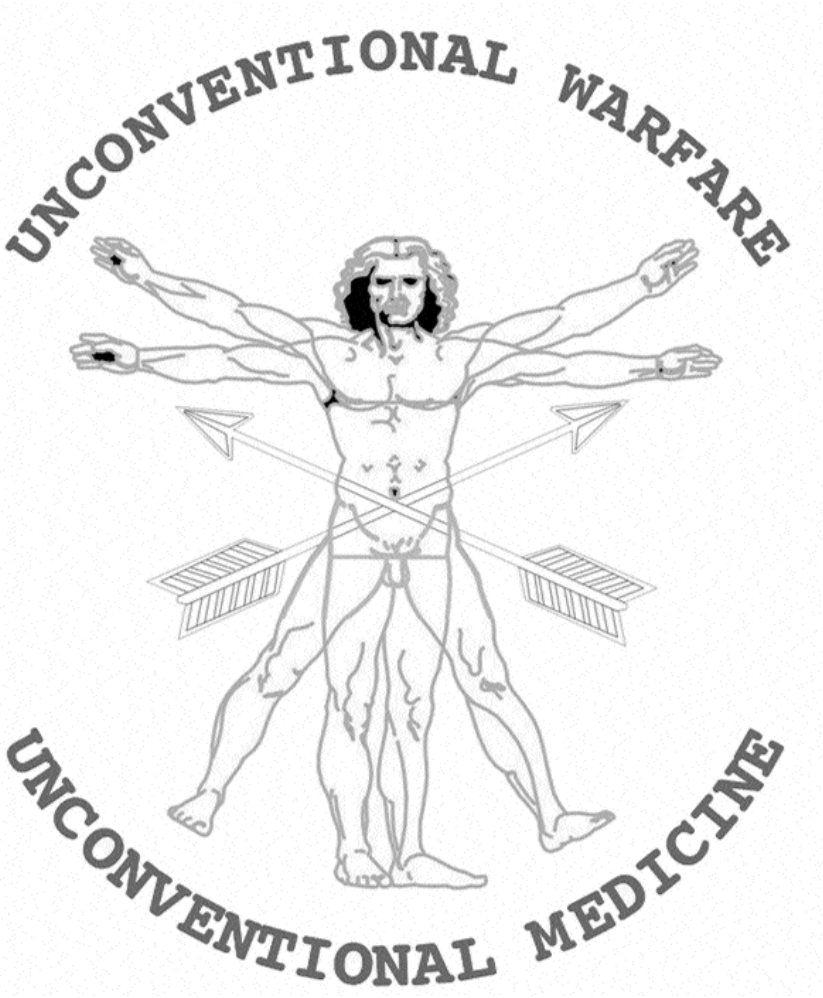
Footnote: *All information contained in this article was obtained from actual measurements, performance data or the flight crewmembers.*



Left to Right COL Anders and medics Acuff and Roberts



COL Anders graduated from LSU Medical School and completed his Orthopaedic Surgery Residency at LSU Medical Center. He has 20 years of practice experience and 10 years as the sole provider of Orthopaedic care to four rural communities. He is a Master Flight Surgeon with 20 years experience, both in the Air Guard/Reserve (A-37, F-4C, F-15B) and Army Guard/Reserve (UH-1H, OH-58, MH-60, MH-47). COL Anders has six years prior enlisted experience with the Army Special Forces Guard/Reserve as a 05B (now 18E) communicator.



Diagnosis, Treatment, and Prevention of High-Altitude Illness

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ABSTRACT

This article provides an overview of current concepts in high-altitude medicine. With ongoing operations in the high mountains of the CENTCOM theater, the information provided is essential reading not only for soldiers deployed to this theater but also the medical personnel responsible for their care. Special emphasis is placed on the diagnosis and treatment of high-altitude illness and countermeasures for prevention. By initiating the appropriate diagnostic, treatment, and prevention algorithm, it is possible to maintain the combat effectiveness of soldiers deployed to a high-altitude environment, effectively serving as a combat multiplier.

ACRONYMS

AMS: Acute mountain sickness
HACE: High-altitude cerebral edema (brain edema)
HAPE: High-altitude pulmonary edema (lung edema)

INTRODUCTION

The US Army and its allies are engaged in the war on terrorism in high mountainous terrain at altitudes they have rarely encountered in training, and as is the case with US soldiers, never seen in combat. Special Operations soldiers are at the forefront of this war and will likely continue to be for the foreseeable future. To date, most of the combat has been in the mountains of Central Asia and Afghanistan. According to US Army definitions (*Table 1)*[1], these mountains are classified as "very high" or "extreme" with peaks

TABLE 1. ALTITUDE CLASSIFICATIONS

ALTITUDE	METERS (FEET)	EFFECTS OF ALTITUDE
Low	Sea Level - 1500 m (5,000 ft)	None
Moderate	1,500 - 2,400 (5,000-8,000)	Mild, temporary altitude illness may occur
High	2,400 - 4,270 (8,000-14,000)	Altitude illness and decreased performance is increasingly common
Very High	4,270 - 5,500 (14,000-18,000)	Altitude illness and decreased performance is the rule
Extreme	5,500+ (18,000+)	With acclimatization, humans can function for short periods of time

* Adapted from US Army GTA 08-05-060, " A Soldier's Guide To Staying Healthy At High Elevations" October, 2001

that reach as high as 8600 m (26,000 ft); mountain passes as high as 4000 m (13,000 ft); and valley floors at 2100 m (7000 ft) or higher. Operations in these environments provide unique stresses not only on the soldiers, but also on the medical personnel responsible for their treatment. The purpose of this article is to provide Special Operations soldiers and medical personnel with the most up-to-date information on the diagnosis and treatment of high altitude illness, focusing on field expedient medical therapies and countermeasures for prevention. [For further reading, please see the US Army Technical Bulletin - Medical (TB MED) 288, Ref. 2; or TB MED 591 when it becomes available; and a recent review by Hackett and Roach[3].]

Basic High-Altitude Physiology

The physiological responses to high-altitude hypoxia can be grouped into either immediate or long-term (see footnote). Hyperventilation occurs immediately and is an important response to high-altitude hypoxia. The cause of the hyperventilation is hypoxic stimulation of the peripheral chemoreceptors. The resulting low arterial PCO_2 and alkalosis tend to work against this increase in ventilation, but after a day or so, this braking effect is moderated as cerebrospinal fluid (CSF) pH returns to near normal by renal excretion of bicarbonate. This renal response can be considered part of the long-term response. Polycythemia is an important long-term adaptation to high-altitude hypoxia. The resulting rise in hemogloblin concentration, and therefore O_2 carrying capacity means that although the arterial PO_2 and O_2 saturation are still diminished, the O_2 content for the arterial blood may be normal or even above normal. The stimulus for the increased production of red blood cells is hypoxemia, which releases erythropoietin from the kidney which in turn stimulates the bone marrow. Although the polycythemia increases the O_2 carrying capacity of the blood, it also raises the blood viscosity, which could reduce stroke volume and cardiac output.

Other adaptations that occur at high altitude include a rightward shift of the O_2 dissociation curve, which results in a better unloading of O_2 at the capillary for a given PO_2. The cause of this shift is an increase in the concentration of [2,3] diphosphoglycerate, which develops primarily because of the respiratory alkalosis. The rightward interferes with O_2 loading in the lung, bringing into question the physiological benefit of this response.

Acclimatization to high altitude takes a minimum of 10-14 days and likely longer. The Pakistani army operating in the Hindu Kush region of the Himalaya acclimatizes their personnel over a 7-week period, beginning with a 3-week stay at 3050 m (10,000 ft).[4,5] During the final 4 weeks, the Pakistani soldiers trek to 4270 m (14,000 ft) and return; trek to 5185 m (17,000 ft) and return; and finally to 5836 m (19,135 ft). In a similar geographical location, the Indian army acclimatizes its personnel over a 14-day schedule with increases in altitude at 6 days, 4 days, and then another 4 days.[6] They typically conduct acclimatization by having the battalion hike from its road head to the staging area. US Army guidance from CHPPM and USARIEM states that 70-80% of the respiratory (immediate) component of acclimatization occurs in 7-10 days; 80-90% of overall acclimatization is generally accomplished in 21-30 days and maximum acclimatization may take months to years.[1] All experienced armies agree that high-altitude acclimatization cannot be achieved in less than 10 days. It is worth noting that while physiological acclimatization may be complete by 2 months, creating soldiers that successfully operate at high-altitude can take years.

Despite all of these physiological adaptations, many individuals will still suffer some sort of performance-reducing effects after a brief stay at altitude. These can range from some as mild as a headache or nausea, to life-threatening cerebral or pulmonary edema. The spectrum of high-altitude illnesses is discussed in the following sections.

Definitions and Risk Factors

High-altitude illness describes acute mountain sickness (AMS) and high-altitude cerebral edema (HACE), both of which are cerebral abnormalities, and high-altitude pulmonary edema (HAPE) which affects the pulmonary circulation and blood-gas barrier. HACE and HAPE are both potentially fatal if immediate, decisive countermeasures are not taken. For example, a US combined Special Forces training operation airlifted to the base of Mt McKinley (4200m) experienced debilitating AMS resulting in command transfer and at least 50% of the soldiers bedridden for 24 hours. AMS, while potentially debilitating, is not considered life threatening. All three forms of high-altitude illness fall into the category of "disease, non-battle injury" or DNBI and serve to reduce the combat effectiveness of deployed

soldiers. Whether high-altitude illness occurs is determined by the rate of ascent, the altitude reached, the altitude at which the soldier sleeps, and individual physiology. Risk factors include: a history of high-altitude illness, residence at altitude below 900 m (3,000 ft), exertion, and certain pre-existing cardiopulmonary conditions. Contrary to popular belief, physical fitness is not protective against high altitude illness.[7] Clearly, complex interactions between genetic factors and the environment most likely explain individual susceptibility or relative resistance to these hypoxia-induced illnesses.

Acute Mountain Sickness And High-Altitude Cerebral Edema

Clinical Presentation and Diagnosis

Because AMS is a syndrome of non-specific symptoms, its clinical presentation and diagnosis is subjective. The current consensus of experts in high altitude medicine is that AMS is, "...the presence of headache in an unacclimatized person who has recently arrived at an altitude above 2500 m (8,200 ft) plus the presence of one or more of the following: gastrointestinal symptoms (anorexia, nausea, or vomiting), insomnia, dizziness, and lassitude, or fatigue)"[8]. The symptoms typically develop within 6 to 10 hours after ascent, but sometimes as early as 1 hour. There are no diagnostic physical findings except in the few cases that progress to cerebral edema.

High-altitude cerebral edema is a clinical diagnosis, defined as the onset of ataxia, altered consciousness, or both in someone with AMS or HAPE. Clinically and pathophysiologically, HACE appears to be the end-stage of AMS. In those who also have HAPE, severe hypoxemia can lead to rapid progression from AMS to HACE. Associated findings of HACE may include papilledema, retinal hemorrhage (a common incidental finding), and occasionally, cranial-nerve palsy as a result of elevated intracranial pressure. Drowsiness is commonly followed by stupor. Seizures are rare. Usually, the illness progresses over a period of hours or days. The cause of death is brain herniation.

Many conditions mimic AMS and HACE (*Table 2*). The onset of symptoms more than three days after arrival at a given altitude, the absence of headache, a rapid response to fluids or rest, and the absence of a response to descent, oxygen, or dexamethasone all suggest other diagnoses.

Table 2. Differential Diagnosis of High-Altitude Illness

Acute Mountain Sickness and High-Altitude Cerebral Edema
Acute psychosis
Arteriovenous malformation
Brain tumor
Carbon monoxide poisoning
Central nervous system infection
Dehydration
Diabetic ketoacidosis
Exhaustion
Hangover
Hypoglycemia
Hyponatremia
Ingestion of toxins, drugs, or alcohol
Migraine
Seizures
Stroke
Transient ischemic attack
Viral or bacterial infection

High-Altitude Pulmonary Edema
Asthma
Bronchitis
Heart Failure
Hyperventilation syndrome
Mucus plugging
Myocardial infarction
Pneumonia
Pulmonary embolus

Treatment and Prevention Countermeasures

Management of AMS or HACE follows 3 axioms: (a) further ascent should be avoided until symptoms have resolved; (b) patients with no response to medical treatment should descend to a lower altitude, and (c) at the first sign of HACE, patients should descend to a lower altitude. *Table 3* suggests management and prevention options for 4 common clinical scenarios. *Table 4* lists useful therapeutic agents.[9-21] A few points are worth emphasizing. Descent and supplementary oxygen are the treatments of choice, and for severe illness, the combination provides optimal therapy. Remarkably, a descent of only 500 to 1000 m (1600 to 3200 ft) usually leads to resolution of AMS. HACE may require further descent. Simulated descent with a portable hyperbaric chamber is also effective. With the use of these chambers at a pressure of 2 psi (13.8 kPa), the equivalent altitude is roughly 2000 m lower than the ambient altitude (*Table 4*).

When the combat or operational situation does not allow for descent or supplemental oxygen is unavailable, medical therapy becomes crucial. Acetazolamide and dexamethasone are both effective in reducing symptoms when used independently.[10,12,13,22] It is not known if combined usage is more

effective than using either agent alone. Ibuprofen (400 mg or 600 mg, single dose) is effective in reducing or resolving high-altitude headaches.[18,23] Acetazolamide may be the safest for treatment of high-altitude associated insomnia since it reduces periodic (Cheyne-Stokes) breathing and improves nocturnal oxygenation. Sedatives should be avoided to aid sleeping due to the risk of respiratory depression. Zolpidem does not depress ventilation at high altitudes and may be a safe choice to treat high-altitude associated insomnia, however extensive clinical studies have not been conducted. After AMS has resolved, any further ascent should be made with caution, possibly with acetazolamide prophylaxis.

Gradual ascent is the best strategy for prevention of AMS and HACE. Suggested guidelines are that once above an altitude of 2500 m (8200 ft), the altitude at which one sleeps should not increase by more than 600 m (2000 ft) in 24 hours and that an extra day should be added for acclimatization for every increase in 600 to 1200 m (2000 to 4000 ft). Most experts recommend prophylaxis for those who plan to ascend from sea level to over 3000 m (9850 ft) sleeping altitude in one day and for those with a history of AMS. Acetazolamide is the preferred drug, and dexamethasone is an alternative. Both are unequivocally effective; the dosages vary.[9,11,13] In 2 controlled trials, *Ginkgo biloba* prevented AMS during gradual ascent to 5000 m (16,400 ft)[20] and reduced both the symptoms and the incidence of AMS by 50% during abrupt ascent to 4100 m (13,450 ft).[19] The notion that overhydration prevents AMS has no scientific basis.

HIGH-ALTITUDE PULMONARY EDEMA

Clinical Presentation and Diagnosis

High-altitude pulmonary edema accounts for the most deaths from high-altitude illness.[24,25] As with AMS, the incidence of HAPE is related to rate of ascent, the altitude reached, individual susceptibility, and exertion; cold, which increases pulmonary artery pressure by means of sympathetic stimulation, is also a risk factor. HAPE commonly strikes the second night at a new altitude and rarely occurs after more than four days at a given altitude, owing to adaptive cellular and biochemical changes in pulmonary vessels.[26]

Early diagnosis of HAPE is critical. In the proper setting, decreased performance and dry cough should raise suspicion of HAPE. Only late in the illness does pink or bloody sputum and respiratory distress develop. Resting tachycardia and tachypnea become more pronounced as HAPE progresses.[27] Cerebral signs and symptoms are common: 50% of those with HAPE have AMS, and 14% have HACE.[28] Of those whose condition deteriorates and who die, 50% have HACE at autopsy. Fever (a temperature of up to 38.5 C) is common. Rales typically originate in the right axilla and become bilateral as the illness progresses. Upper respiratory tract infection or bronchitis may be precipitating factors. The differential diagnosis of HAPE is listed in *Table 2*. Measurements of arterial blood gas reveals severe hypoxemia (PaO_2 = 30 to 40 mmHg) and respiratory alkalosis, but not respiratory acidosis.[16,29]

Susceptibility

Persons with a prior episode of HAPE may have a risk of recurrence as high as 60% if they abruptly ascend to an altitude of 4559 m (14,958 ft).[15] These persons are healthy but have a reduced ventilatory response to hypoxia [30,31] and an exaggerated pulmonary pressor response to hypoxia and exercise.[30,32,33] There is substantial overlap in these measured values between susceptible and non-susceptible groups, however, and it is not possible to predict exactly which healthy persons are at increased risk.

Treatment and Prevention Countermeasures

Increasing alveolar and arterial oxygenation is the highest priority in patients with HAPE. Breathing supplemental oxygen reduces pulmonary artery pressure 30 to 50%,[16,34,35] which is sufficient to reverse the effects of the illness rapidly. Supplemental oxygen (and descent) increases arterial oxygen pressure and benefits the brain as well. Descent, supplemental oxygen, or both are nearly always successful. Monitoring of arterial oxygen saturation by pulse oximetry is adequate to guide therapy. Individuals with severe HAPE, indicated by the failure of arterial oxygen saturation to improve to more than 90% within 5 minutes after the initiation of high-flow oxygen, and those with concomitant HACE must be moved to a lower altitude and possibly hospitalized. If supplemental oxygen is unavailable, then descent, the use of a portable hyperbaric chamber, or both become lifesaving. Medication (nifedipine) is necessary only when supplemental oxygen is unavailable or descent is impossible (*Tables 3 and 4*).

A recent study suggested that inhaled beta-agonists might be useful in the prevention of HAPE, and by extension, for treatment as well.[36] Beta agonists increase the rate of fluid clearance from the alveolar space.[37] and might also lower pulmonary artery pressure.[36] Although more studies are needed to confirm this observation, these agents are safe and convenient and should be considered.

After an episode of HAPE, a soldier should be advised subsequently to ascend to high altitudes more slowly, recognize symptoms of high-altitude illness early, and consider nifedipine prophylaxis, especially after multiple episodes. Soldiers who have recurrent HAPE or HAPE below 2500 m (8200 ft) may require an evaluation to rule out intracardiac or intrapulmonary shunts, pre-existing pulmonary hypertension, mitral-valve stenosis, and other conditions that increase pulmonary vascular resistance.

Intermittent exposure to hypoxia while at low altitudes is an intriguing area for future research. The idea is that the process of acclimatization can be triggered in a person breathing a low oxygen mixture for 15-30 minutes a day at sea level.[38] Thus, in theory, a Special Operations unit could employ intermittent exposure to hypoxia at sea level into their pre-mission preparations thus arriving at high altitudes pre-acclimatized. This is an area deserving of further research.

Additional High Altitude Considerations

While the primary objective of this article is to discuss the diagnosis, treatment and prevention of AMS, HACE, and HAPE, it is necessary to mention several other conditions that while not unique to high mountain environments, can commonly occur during operations at high altitude.

Cold Injuries. Once a soldier has acclimatized to high altitude, cold injuries are generally the greatest threat. Frequent winds in mountain areas cause extremely low wind-chill. Because hypoxia-induced psychological effects can result in poor judgment and decision-making, a higher incidence of cold injuries should be anticipated. Countermeasures for cold injuries include command emphasis in: maintaining nutrition; drinking plenty of fluids; and dressing in layers.

Sunlight Injuries. The potential for solar radiation injuries, caused by sunlight, is significant at high altitudes due to increased ultraviolet (UV) radiation (resulting from thinner atmosphere),[2] and reflection of light from snow and rock surfaces. Solar radiation injuries can be severe and occur with much shorter exposure at high altitude. Injuries include sunburn and snow blindness. Some medications can increase the threat of sunburn, such as some malaria prophylaxis and acetazolamide. Using sunglasses or goggles with UV protection and side shields can prevent snow blindness.

Carbon Monoxide (CO) Poisoning. The potential for CO poisoning is increased at high altitude due to inefficient fuel combustion resulting from the low oxygen content of air and the higher usage of stoves, combustion heaters, and engines in enclosed, poorly ventilated spaces. Countermeasures include ensuring soldiers do not sleep in vehicles with engines running, cook inside tents, or sleep inside tents with working combustion heaters or stoves without adequate ventilation.

Conclusions

This review gives soldiers operating in high-altitude environments the necessary information to diagnose, treat, and prevent high-altitude illness. The proper training of all team members in high-altitude countermeasures is essential in maintaining combat effectiveness. The ability to maintain combat effectiveness at high altitude serves as a combat multiplier ensuring the greatest likelihood of successful missions.

Footnote

The barometric pressure decreases with distance above the earth's surface in an approximately exponential manner. The barometric pressure at 5500 m (18,000 ft) is only one-half the sea level normal 760 mm Hg, so the PO_2 of moist inspired gas is (380 - 47) ´ 0.2093 = 70 mm Hg; where 380 is the barometric pressure at 5500 m, 47 is the partial pressure of water vapor at body temperature, and 0.2093 is the fractional content of O_2 in inspired gas.

Acknowledgements

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TABLE 3. OPTIONS FOR THE MANAGEMENT AND PREVENTION OF HIGH-ALTITUDE ILLNESS

CLINICAL PRESENTATION	MANAGEMENT	PREVENTION
Mild acute mountain sickness Headache with nausea, dizziness, and fatigue during the first 12 hrs after rapid ascent to high altitude (>2500 m)	Descend 500 m (1600 ft) or more; or stop, rest, and acclimatize; or speed acclimatization with acetazolamide (125-250 mg twice daily); or treat symptoms with analgesics and antiemetics; or use a combination of these approaches	Ascend at a slow rate; spend a night at an intermediate altitude; avoid overexertion; avoid direct transport to an altitude of more than 2750 m (9000 ft); consider taking acetazolamide (125-250 mg twice daily) beginning 1 day before ascent and continuing for 2 days at high altitude
Moderate acute mountain sickness Moderate-to-severe headache with marked nausea, dizziness, lassitude, insomnia, fluid retention at high altitude for 12 hrs or more	Descend 500 m (1600 ft) or more; if descent is not possible, use a portable hyperbaric chamber or administer low-flow O_2 (1-2 L/min); if descent is not possible and O_2 is not available, administer acetazolamide (250 mg twice daily), dexamethasone (4 mg orally or intramuscularly every 6 hrs), or both until symptoms resolve; treat symptoms; or use a	Ascend at a slow rate; spend a night at an intermediate altitude; avoid overexertion; avoid direct transport to an altitude of more than 2750 m (9000 ft); consider taking acetazolamide (125-250 mg twice daily) beginning 1 day before ascent and continuing for 2 days at high altitude; treat acute mountain sickness early
High-altitude cerebral edema Acute mountain sickness for 24 hrs or more, severe lassitude, mental confusion, ataxia	Initiate immediate descent or evacuation; if descent is not possible, use a portable hyperbaric chamber; adminster O_2 (2-4 L/min); administer dexamethasone (8 mg orally, intramuscularly, or intravenously initially, and then 4 mg every 6 hrs); administer acetazolamide if descent is delayed	Avoid direct transport to an altitude of more than 2750 m (9000 ft); ascend at a slow rate; avoid overexertion; consider taking acetazolamide (125-250 mg twice daily) beginning 1 day before ascent and continuing for 2 days at high altitude; treat acute mountain sickness early
High-altitude pulmonary edema Dyspnea at rest, moist cough, severe weakness, drowsiness, cyanosis, tachycardia, tachypnea, rales	Administer oxygen (4-6 L/min until condition improves, and then 2-4 L/min to conserve supplies); descend as soon as possible, with minimal exertion, or use a portable hyperbaric chamber; if descent is not possible or oxygen is not available, administer nifedepine (10 mg orally initially and then 30 mg of extended-release formulation orally every 12-24 hrs); add dexamethasone if neurologic deterioration occurs	Ascend at a slow, graded rate; avoid overexertion; consider taking nifedipine (20-30 mg of extended-release formulation every 12 hrs) in persons with repeated episodes

TABLE 4. MEDICAL THERAPY FOR HIGH-ALTITUDE ILLNESS

AGENT	INDICATION	DOSE	MECHANISM OF ACTION	ADVERSE EFFECTS	COMMENTS
Oxygen	All high-altitude illnesses	2-4 L/min by cannula or mask initially, then titrate dose until SaO2 > 90%	Increases PaO_2; reduces cerebral blood flow and volume, and pulmonary artery pressure	None	Lifesaving for HAPE; improves headache within minutes in AMS
Portable hyperbaric chamber	All high-altitude illnesses	Depends of model; 2-4 psi for a minimum of 2 hrs; continue as long as necessary	Simulates descent; increases PaO_2	Potential rebound effect after removal of patient from chamber; limits access to airways	Effects equivalent to the administration of low flow O_2; can be lifesaving; does not require O_2, but can add supplemental O_2 by cannula or mask, if necessary
Acetazolamide	Prevention of AMS	125-250 mg orally twice a day 24 hr sbefore ascent and first 2 days at high altitude	Carbonic anhydrase inhibitor; causes bicarbonate diuresis and respiratory stimulation; increases PaO_2; reduces formation of CSF; promotes ion transport across the blood-brain barrier	Paresthesias; alters taste of carbonated beverages; polyuria	Sulfonamide reactions possible; can be taken episodically for symptoms; no rebound effects
	Treatment of AMS	250 mg twice a day orally until symptoms resolve			
Dexamethasone	Prevention of AMS	2 mg every 6 hr or 4 mg every 12 hr orally	Unknown; may reduce brain-blood volume; may prevent blood-brain leak	Mood changes; hyperglycemia; dyspepsia; rebound effect on withdrawal	Can be lifesaving for AMS or HACE; effects evident in 2-8 hrs; no effect on acclimatization; no value in HAPE
	Treatment of AMS	4 mg every 6 hr orally, IM, or IV			
	HACE	8 mg initially, then 4 mg every 6 hr orally, IM, or IV			
Furosemide	AMS or HACE	20-40 mg orally every 12 hrs for a total of 2 doses	Diuresis; decreases extracellular fluid; causes venodilatation	Hypovolemia; hypotension; hypokalemia	Currently out of favor; not recommended for prevention; not established for use in HAPE
Nifedipine	Prevention of HAPE	20-30 mg of extended-release formulation orally every 12 hrs	Calcium-channel blocker; reduces pulmonary artery pressure	Reflex tachycardia; hypotension (uncommon)	No value in AMS or HACE; not necessary if supplemental oxygen available
	Treatment of HAPE	10 mg orally initially, then 20-30 mg of extended-release formulation orally every 12 hrs			
Nonsteriodal anti-inflammatory drugs			Inhibits prostaglandins	Dyspepsia; gastrointestinal bleeding	No clinical trials of aspirin for treatment or of ibuprofen for prevention; naproxen ineffective
Aspirin	Prevention of headache	325 mg orally every 4 hrs for a total of 3 doses			
Ibuprofen	Prevention of headache	400 or 600 mg orally once; may be repeated			
Gingko biloba	Prevention of AMS	80-120 mg orally	Unknown; may block inducible nitric oxide; an oxygen radical scavenger; may block platelet-activating factor	Occasional headache; rare episodes of bleeding	Requires further study; should not be used with antithrombolytics

AGENT	INDICATION	DOSE	MECHANISM OF ACTION	ADVERSE EFFECTS	COMMENTS
Antimetics	Nausea; vomiting		Phenothiazine; centrally acting	Extrapyramidal reactions; sedation	Use diphenhydramine intramuscularly for extrapyramidal reactions
Prochlorperazine		10 mg orally or IM every 6-8 hr			
Promethazine		25-50 mg orally, IM, or rectally every 6 hr			
Zolpidem	Insomnia	10 mg orally	Nonbensodiazepine modulator of g-aminobutyric acid receptors	Rare, short-acting	Does not depress ventilation at high altitude

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Special Ops Foot Care

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ABSTRACT

Foot care is a forgotten skill not often taught to soldiers today. Healthy functional feet improve military performance. Foot pain, infection, and disability are not a necessary part of every road march. Proper cleansing and nail trimming, along with thick, insulative layered socks, are important factors in foot care. Blister prevention and care involve simple procedures and materials. Preventive techniques, proper fitting footwear, and quick early management will avoid the most common foot ailments.

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Foot problems, including hot spots, blisters, bruises, and tendonitis continue to be significant problems for military personal. Foot care is given short shrift in training today. Issue socks are terrible. Blisters are considered a necessary part of every road march. Many otherwise excellent soldiers fail qualifying courses because of torn up feet. Lost duty time is an expensive result of infections and sore feet. This is all unnecessary. Foot care, choosing socks, fitting boots, and proper lacing are simple concepts that will make road marching and day-to-day activity a lot more pleasant and injury free.

Soldiers carry heavy loads over long distances and rough terrain, in hot, cold, wet, dry, and jungle environments. It's no wonder the feet take a beating. To understand how to protect them, you need to know a little anatomy and physiology.

Feet are a series of bony prominences covered with soft tissue and skin. As your heel strikes the ground and you start your roll forward into your stride, you put great pressure and shear forces on the skin and soft tissues. Bones go one way and the boot goes the other. Body weight, strike force, and load combine to exert huge forces on the foot. Protecting the foot is what this paper is about.

Feet should be washed as often as feasible. This allows you to feel for tender spots and massage the fluid out of your feet. It lowers the bacteria count on your skin so if you get a cut or blister it's less likely to get infected. Nails should be trimmed properly with round corners to prevent ingrown nails. Spraying with an antiperspirant daily will decrease sweating and help control athletes foot (tinea pedis).

Blisters are produced by increasing moisture in the socks and shear forces. As moisture builds up in the fibers of the sock, the frictional forces increase on the skin. As the foot moves inside the boot, the shearing gets greater and greater. The inside of the skin goes one way and the outside goes the other and blisters occur. They start as a red hot spot. If caught early and protected, a bleb won't form.

Everyone should carry a blister kit. The kit consists of povidone-iodine (Betadine® swabs), Silipos® sheet (a gel-based product that is used to provide extra cushioning), a 22g hypodermic needle, triple antibiotic ointment, and 1" adhesive tape. The skin should be washed and dried. It is then painted with Betadine® and allowed to dry twice. The needle is started outside the blister and directed under the edge of the bleb into the fluid. Use the swab to press out the fluid. Cut a donut out of Silipos® bigger than the border of the bleb. Stick it on the skin and fill the inside of the donut with the ointment. Now cover the entire thing with tape. Change the tape and add more ointment daily until healed. Do not use benzoin, phenol, formaldehyde, Clorox® (bleach), and other caustic materials. Pain and infections are the common result.

It is important to keep the skin on the feet as dry as possible. Antiperspirants or a blocking agent marketed under the name of Hand Sense® will decrease the sweating of your feet. Antiperspirants should be used in all environments.

People have forgotten what socks are supposed to do. They should insulate from heat, cold, and fire. They should be thick enough to keep the foot away from the boot (stand-off). They should move water away from the foot, provide for swelling, and provide for some impact protection. Most socks produced today do not address these issues.

With the understanding of how blisters form and my long interest in protecting the feet from frostbite and trenchfoot, I designed a sock system to do it all. It is a two-sock system. The liner is a Dupont polyester material called Coolmax. It is better than polypropylene because it moves water faster and doesn't retain odors. The outer sock is the special one. The yarn is 50-50 wool-polypro intimately blended with each fiber against each fiber. It is tightly twisted (8 per inch) to make an extremely strong durable yarn. The sock is densely knit with a deep terry surface on the outside and a smooth surface on the inside. The nap faces out. This provides for better moisture transfer to the boot and does not pill and matt down. The outer smooth surface of the inner sock lies against the smooth inner surface of the outer sock so the shearing occurs between the two socks, not on the skin. It is a thick, heavy, ugly, green sock that you will fall in love with. It helps keep your feet warm and dry in the winter, cool and dry in the desert, and plays a major role in preventing blisters. It has been type classified by the Marines, been tested at basic training sites and Ranger school, and been used by many special ops units all over the world. A Pararescue team has used them for two Eco-Challenges with no blisters. Civilian use has been on sledge trips at both poles, extensive mountaineering trips, logging, forest-firefighting, and long treks. You may need a larger boot: a half size longer and one width wider. Foot protection requires thickness, so a bigger boot to go over thick socks is necessary.

Boot fitting is a mystery to most consumers and shoe sales people. Here is a system that works. Take your loaded pack, the socks you will wear, orthotics if you use them, and go to the boot store. Put on the pack and socks, and standing, lean forward to extend the toes. Measure each foot, length and width, at least twice. We will fit length first then width. Take the biggest foot, say 9-C and tell the fitter to get 9-C, 9-D, 9-E, 91/2, C, D and E. Start with the smallest and work up. Put the boots on unlaced and jam your feet all the way to the end of the boots. Lean a bit forward and slide your middle finger down inside the heel counter to the sole. It should just slide in. If it won't go to the sole, it's too short. If there is space behind the finger it's too long. Now jam your heel back into the heel counter. Your longest toe should be a half inch from the inside end of the boot. Lace the boots up 6 eyelets and tie them tight. Put on the pack and walk around the shop. There should be no heel-lift inside the counter. You must be able to lace the 6 eyelets tight enough to stop heel-lift. If not, go to a half size shorter. The boots should be snug around the ball of the foot but not tight. Boots will shorten slightly and widen a bit with wear.

The lacing technique called "differential lacing" will help stop foot movement inside the boot and prevent blisters. Use one set of laces to lace 6 eyelets and tie them off. Use a second set to lace the upper boot looser to allow for blood flow and calf motion. Some boots now come with lace locks so one set of laces can be used.

There are thousands of boots on the market but only a few capable of withstanding the rigors of military use. They must have a natural leather midsole to take the shape of the bottom of the foot. The Birkenstock® cork-rubber add-on insole is best for synthetic mid-sole shoes. They may hurt for 3 days while they break in, but then they are great. If you want the best, then get handmade boots. They last many years and fit like a glove.

Vapor-barrier socks can be worn to keep the wool-polypro insulative sock dry in cold-wet or jungle environments. They are lightweight, cheap, and easily replaced if they leak. They should be worn on either side of the wool sock. Wide rubber bands to seal the tops when crossing streams complete the footwear.

Boots should be treated with waterproofing material that matches the original leather treatment from the factory. Oil-and-wax based dubbing goes on oil and wax leathers. Silicones go on siliconized boots. Two new materials are compatible and much better and longer lasting. Nikwax®, a British product, and Blue Majic®, an American product, provide long lasting water-repellency that still allows the leather to breathe and not get hard when the leather gets cold.

Boots should be kept in good repair. Heels should be replaced when one quarter of an inch has worn off the ground strike point. Knee, arch, hip and lumbar pain result from worn heels.

In summary:

1. Use antiperspirants to keep your socks dry.
2. Use a two-sock system with a hydrophobic liner and a thick wool outer.
3. Fit boots properly. Get high quality footwear.
4. Differential lace your boots.
5. Take care of hot spots and other minor problems early.

Foot problems take a long time to heal, cause knee, hip, and back pain, and change your stride and gait. Healthy functional feet enhance mission accomplishment.



Dr Hamlet attended Southern Illinois University, majoring in zoology with a minor in chemistry. He then graduated as a DVM from Washington State University in 1969. That same year he entered the Army as a Captain in the Veterinary Corps, and was assigned to the Arctic Medical Research Laboratory in Alaska for three years. He came to the US Army Research Institute of Environmental Medicine (USARIEM) in 1972 as the Director of the Pathology Division in charge of both pathology research and animal care. With the closure of the Alaska laboratory, cold research was added. Later, he served as the Director of the Research Programs and Operations Division, and is now recently retired. He continues to lecture widely to both military and civilian audiences on cold injury recognition, prevention, and treatment. He is recognized as the institutional memory for cold injury and is frequently asked to make contributions to textbooks, publications, and training documents.

Preventive Medicine Interoperability, Joint Task Force-510, Operation Enduring Freedom - Philippines (OEF-P)

Derek Licina, CPT

ABSTRACT

Effective Preventive Medicine (PM) measures and countermeasures developed for Special Operation Forces (SOF) are critical in maintaining the fighting strength of men performing their mission in far-forward, austere, and challenging conditions. It was these measures develped by a Joint SOF Air Force/Army PM team which were integrated into the mission of JTF-510 during OEF-P, that resulted in a documented Disease and Non-Battle Injuries rate between 3 and 5 percent and the establishment of a medical surveillance program during Phase I of the operation.

BACKGROUND

"One of the missions of special forces (SF) is to develop, organize, equip, train, and direct indigenous forces in the conduct of guerrilla warfare and to advise, train, and assist host country forces in counterinsurgency operations, FM 31-21[1]." Thirty-seven years later, Joint Task Force-510 (JTF-510) performed this unconventional warfare mission in support of Operation Enduring Freedom - Philippines (OEF-P). Six hundred US military personnel deployed to support Philippine forces in combating the Abu Sayyaf, a terrorist group linked to Osama bin Laden's terrorist network. Composed of a myriad of services and agencies, JTF-510 directly supported 160 Special Operations personnel and their Filipino counterparts in combating threats while operating in an austere tropical jungle environment.

With advising, training, and assisting the host nation forces outside direct combat as the primary objective during Phase I of the operation, Disease and Non-Battle Injuries (DNBI) would account for a majority of the JTF-510 casualties. The JTF-510 Preventive Medicine (PM) team consisted of one Army Environmental Science Officer (ESO), an Air Force Bio-Environmental Engineer Craftsman (BEE-tech), and an Air Force Public Health Craftsman (PH-tech). The PM Team combated DNBIs while simultaneously establishing a medical surveillance program for the JTF-510 personnel in accordance with DOD Directive 6490.2[2] and DOD Instruction 6490.3[3].

PRE-DEPLOYMENT

Once Special Operations Command Pacific (SOCPAC) finalized the Task Organization for Phase I of OEF-P, coordinated efforts were made between the JTF-510 PM personnel. JTF PM team Officer in Charge (OIC), assigned to the 1st Special Forces Group at Fort Lewis, Washington, contacted the 353rd Special Operations Group Support Squadron, BEE and PH techs located on the island of Okinawa, Japan who would be acting as the JTF-PM Non-Commissioned Officers in Charge (NCOIC). Capabilities, limitations, and concerns were identified and the Military Decision Making Process initiated.

CAPABILITIES

Operating on a southern island within the Philippines, SF personnel would be exposed to numerous medical threats while conducting non-standard military operations. Understanding the organization, mission, and methods of employment of these SF warriors was instrumental for the JTF-510 PM OIC to focus on the PM support requirements. Assigning the SF Group ESO, the primary planning responsibility would pay significant dividends in the

planning process. Additionally, the only other PM specialist within the Area of Operation (AOR) was organic to the SF Battalion with whom the JTF-510 PM OIC had already established a working relationship prior to deployment. With limited time and resources, coordination with external agencies would prove vital in collecting relevant medical intelligence for use in developing a PM Annex to the JTF Deployment Order (DEPORD). The United States Army Special Operations Command (USASOC) Medical Intelligence Specialist and the Armed Forces Medical Intelligence Center (AFMIC) consolidated medical intelligence from both open and closed sources, identifying infectious diseases and environmental health risks within the JTF AOR. Additionally, the United States Army Center for Health Promotion and Preventive Medicine (USACHPPM)-Deployment Environmental Surveillance Program (DESP), in conjunction with AFMIC, developed Industrial Hazard Assessment reports of each major city in which personnel would be deployed. These reports identified potential acute and chronic health hazards associated with industrial operations within the AOR that could affect deployed personnel.



Army SOF Preventive Medicine Officer conducting an inspection of the local water tanker.

LIMITATIONS

Incorporating medical intelligence collected from USASOC and AFMIC into the Risk Assessment Matrix of FM 100-14[4], the initial medical risk assessment for OEF-P was determined to be Extremely High (Hazard Probability of Likely and Hazard Severity of Catastrophic). Developing and implementing force health protection countermeasures prior to the deployment of 600 multi-service personnel stationed throughout the Pacific would be a complex task for the JTF PM team.

Ensuring that all deploying personnel were in compliance with the SOCOM Directive 40-4[5] and the JTF-510 DEPORD PM Annex would be a significant challenge. Deploying personnel were required to receive all immunizations, complete a pre-deployment health assessment DD Form 2795[6], received a pre-deployment medical threat briefing, dental and medical screening, issue appropriate chemoprophylactic medication, and provided personal protective measures (such as Permethrin treated bed netting, insect repellent, uniform impregnation kits, water purification tablets, and sunscreen). An active Intra-theater Staging Base (ISB) medical team would be critical in verifying compliance and ensuring personnel departing for the AOR had received their appropriate preventive medicine measures.

With an AOR encompassing three distinct islands in the southern Philippines, providing PM support with three personnel would be enormously demanding. Personnel operated in camps ranging from established hardened structures and fixed facilities to those sleeping in hammocks. The additional personnel requirement to accomplish all PM missions and reduce the DNBI risk at these three distinct locations for the JTF Commander was identified. However, due to a personnel cap, this request was noted, denied, and risk assumed.

In accordance with doctrine, the 353rd SOG would deploy for Phase I of OEF-P, originally a 30-day period, and transition with the 374th Medical Group, Small Portable Expeditionary Aero- medical Rapid Response (SPEARR) Team. With such a rapid turnover, there would be little continuity within the JTF-PM staff, increasing the demands on the already undersized team.

An initial base campsite reconnaissance of the AOR had been conducted months prior to the

publishing of the JTF Task Organization and identification of the JTF-PM OIC. Without integrating the JTF-PM OIC and additional veterinary support in the site reconnaissance, preventive medicine site assessments and proposed food and water source inspections were not completed prior to deployment of the JTF-510 ADVON.

Preventive Medicine equipment required to maintain the force health protection of the entire JTF for a 30 day period was not on hand and would not be fielded prior to deployment. Upon request, USACHPPM DESP was able to provide sampling equipment to include: mini-volume particulate air sampling pumps; an environmental backpack with deployment sampling kits composed of soil, water, and air sampling media, and additional sampling equipment in an expeditious manner for use during the environmental baseline site characterization process FM 3-100.4.



Environmental air contamination from the daily local custom of burning all solid waste.

DEPLOYMENT

Among the first 100 JTF personnel deployed within the AOR, personal security played a significant factor in how Force Health Protection objectives were prioritized and accomplished by the JTF-PM team. Initial missions included base camp assessments, updating the pre-deployment health risk assessment, implementing countermeasures for identified risks on the ground, and developing an Occupation and Environmental Health Surveillance Program as specified in Joint Memo MCM 0006-02[3].

Medical risks identified during the initial base camp assessments included: potential food borne illness from local catered food sources, consuming bottled water not identified as an approved source in VETCOM Circular 40-1[7], insufficient hardened living space to support the JTF main body, numerous vector breeding grounds, and environmental contamination stemming from cultural daily burning of trash, poor sanitation practices, overflowing landfills, and polluted municipal water systems. Although these characteristics are typical of those found in a special operations environment, they were atypical for conventional support personnel operating as part of JTF-510. In light of the JTF depending upon local infrastructure for food, water, and shelter, the political ramifications of our actions would have to be considered during the health risk mitigation process of maintaining a healthy force.

The PM team and a Filipino Air Force veterinarian worked with and educated local food caterers on safe food procurement and preparation. Vector control was conducted in conjunction with a local military healthcare technician in and around facilities where JTF-510 personnel would be living and working. Solid waste consolidation, separation, and disposition were discussed and abatement actions implemented for both local and JTF-510 personnel. US Army field sanitation team (FST) supplies outlined in FORSCOM Regulation 700-2[8] such as rodenticidal bait, insecticides (Demand Pestab®), larvicide (Bactimos Briquettes®), and fly bait were applied to vector breeding sites. Although devices such as a two-gallon gas powered backpack sprayer were on hand, adverse perceptions of our modern equipment from local personnel dictated the use of equipment such as the hand held 2-gallon sprayer, which could be procured locally. A majority of our risk mitigation was conducted through, by, and with our Filipino counterparts. This served to strengthen our working relationship, as well as educate local



USAF SOF BEE-tech sampling water from a local distribution system.

personnel on safe and healthy cultural practices. Upon arrival of the main body, the priority of efforts shifted to the forward deployed SF Battalion 91S and working with the JTF civilian contractor, DynCorp©.

With no running water, primitive bathrooms, no buildings to sleep in, open pit trash collection, and questionable food preparation and service practices, the 91S executed the lost art of basic field sanitation. Pushing forward supplies such as new 55 gallon drums, PVC pipes, wire screening, and basic field sanitation supplies such as calcium hypochlorite and vector control supplies, he constructed field showers, water holding tanks for personal hygiene and food preparation, hand washing stations, pipe urinals, trash incinerators, and a myriad of other basic sanitation measures in the austere environment.

Simultaneously, the JTF-PM team worked directly with the J4 and DynCorp© as the Contracting Officer Representative (COR) in the fields of water quality, vector control, hazardous material/waste, food production, public health, and cargo retrograde operations. Issues, discussions, and recommendations were made during deep well drilling, forward aerial refuel point development, contractor pesticide application, hazardous material storage and waste disposition, occupational hazards, and dining facility construction/operation. As Phase I transitioned to Phase II, these duties and responsibilities would require a significant amount of time and oversight.

LESSONS LEARNED

The MFST BEE-tech and PH-tech expertise enabled them to seamlessly integrate force health protection into the joint unconventional operation. However, for the AF techs to be properly utilized, it would have been beneficial to have them execute both Phase I and Phase II of the operation. The techs would have already developed a working rapport with the JTF staff as well as local population during Phase I, increasing the PM team's ability to accomplish its mission during Phase II. Continuity in performing the health risk assessment for the command during Phase I and also performing remediation during Phase II is critical.

To perform this function, it is imperative that the BEE and PH-techs deploy with comprehensive sampling media, equipment, references, and other items to not only sustain their individual unit requirements, but also perform all preventive medicine tasks required for the number of personnel deployed in support of the JTF. If air, soil, water, and vector sampling equipment are not already incorporated into the unit authorization document, it should be added and procured as soon as possible.

Standardizing sampling equipment, media, and methodology with USACHPPM would allow for the seamless execution of a medical surveillance program by any service. Without this equipment, sampling, and analytical capabilities of any PM asset are greatly reduced, directly impacting the capability to identify environmental risks associated with the operation.

Crosstraining the BEE and PH curricula would be beneficial not only to the individual, but also to a JTF Preventive Medicine team. An increased capability in lieu of not having additional support is critical when a small number of personnel are expected to execute all preventive medicine tasks. With this level of crosstraining, the BEE and PH technicians could perform independently in both functional areas on future operations and joint missions.

Creating a joint repository for deployment occupational and environmental health data could standardize efforts across the services. USACHPPM is currently accomplishing this task through the use of the Deployment Environmental Surveillance System V 1.0. Air, water, and soil data collected from analyzed samples is captured in a comprehensive data base which provides the deployed PM personnel data required to execute their DOD Directive medical surveillance mission. Integrating this system with the Air Force Global Expeditionary Medical System (GEMS) could standardize all the services ability to predict potential exposures, mitigate hazards, diagnose symptoms, and treat illnesses of personnel deployed or deploying to a potentially hazardous area.

Utilizing USASOC, AFMIC, and USACHPPM intelligence products during the predeployment planning process assisted in focusing the PM mission and increased the overall productivity of the small JTF-PM staff. During the decision making process outlining the duties and responsibilities as they apply to the contractor in the JTF statement of work, a SOCPAC PM representative must be involved to ensure all preventive medicine measures and countermeasures are outlined IAW military regulations prior to final approval by the regional CINC. If the regional SOC command is not authorized a PM slot, one should be incorporated into the unit-manning document. The individual should directly and indirectly support any deployed SOF PM personnel within the region and serve as a subject matter expert liaison between deployed personnel on the ground and rear echelon command and control elements.

CONCULSION

Upon completion of Phase I, the three person JTF PM team achieved their goals. During Phase I of the operation, documented DNBI rates were maintained between 3 and 5%. A comprehensive medical surveillance program had been initiated with environmental samples and extrapolated data sent between the AOR and USACHPPM analytical laboratory. Preventive medicine measures were incorporated into the contractor Statement of Work (SOW) and thorough oversight of each DynCorp© contract was implemented. Additionally, an environmental baseline assessment was initiated during Phase I and completed by the Phase II JTF-PM team. These Preventive Medicine successes were a true testament to the hard work and dedication of the JTF PM team in safeguarding the health and welfare of the special operation forces combating terrorism.

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CPT Derek J. Licina the Group Preventive Medicine Officer for 1st Special Forces Group. He served as the Phase I, JTF-510 Force Health Protection Officer from January - April 2002.

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CONTINUING MEDICAL EDUCATION TEST

HEALTH ISSUES IN AFRICA:
A GROWING SECURITY CONCERN

JSOM

1. Which of the following is the leading cause of death in sub-Saharan Africa?

   a) HIV/AIDS
   b) Tuberculosis
   c) Malaria

2. Who, among the following, is most likely to transmit HIV/AIDS and TB beyond the continent of Africa?

   a) Military
   b) Transient workers
   c) Prostitutes

3. According to this article, experts primarily attribute the severity of the African AIDS epidemic to which of the following?

   a) Poorly trained health care workers
   b) Lack of government interest
   c) Poverty

4. According to this article, which of the following plays a major role in the spread of HIV?

   a) Polygamy
   b) Fear of disclosure and attached judgments
   c) Catholic church will not endorse condom usage
   d) All of the above play a major role in the spread of HIV

5. How many million AIDS contaminated orphans are currently living in Africa?

   a) 6.5
   b) 9.5
   c) 12.1

6. According to the South African National Tuberculosis Association, roughly how many of all South African TB patients are are infected with HIV?

   a) One third
   b) One half
   c) Three quarters

7. In recognition of the growing challenge in spurring action against HIV/AIDS and other major diseases, the US State Department created the Office of_____as the State Department's focal point for global health affairs.

   a) International Health Affairs (IHA)
   b) Sub-Saharan African Affairs
   c) African Continental Health

8. Which of the following best describes the purpose of the US Navy DoD HIV/AIDS Prevention Program (MASIBAMBISANE)?

   a) Provide funding for Prevention of Mother to Child Transmission
   b) Reduce the incidence of HIV/AIDS among military personnel in selected African nations
   c) Find homes for AIDS orphans

9. What two organizations are working together with the Republic of Botswana to improve the overall state of HIV/AIDS care and treatment in Botswana?

   a) The Bill & Melinda Gates Foundation and Merck & Co. Inc.
   b) Merck & Co., Inc. and the Phillip Morris Company
   c) The Bill & Melinda Gates Foundation and the Phillip Morris Company

10. Which of the following medicines treats and prevents river blindness and lymphatic filariasis.

    a) Clotrimazole
    b) Bismuth
    c) ASA
    d) Mectizan

11. Which of the following are described as being the cornerstone of the PMTCT program?

    a) Voluntary counseling and HIV testing (VCT)
    b) HIV/AIDS prevention and treatment in the military
    c) Orphan and abused spouse treatment

Continuing Education Evaluation Form
Journal of Special Operations Medicine, Volume 3, Edition 1 / Winter 03

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POST-TEST – Answer Sheet
Health Issues In Africa: A Growing Security Concern Page 20

1.	a	b	c		6.	a	b	c		11.	a b c
2.	a	b	c		7.	a	b	c			
3.	a	b	c		8.	a	b	c			
4.	a	b	c	d	9.	a	b	c			
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Article 1
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Ovine Polyvalent Immune Fab (CroFab) -- A New Tool

Warner Anderson, MD

A new weapon in the envenomation armamentarium, CroFab® is a highly purified protein antibody derived from sheep serum. While the equine-derived antivenin is essentially a crude extract with a great deal of other horse proteins (thus, antigens), CroFab® is composed of antibodies which have been cleaved with papain to leave the active component only, while removing all other foreign proteins. Additionally, it is thought, or implied, that fewer people are allergic to sheep than to horse proteins.

In theory, it makes sense. So much sense, in fact, that a skin test is not recommended and is not included with the CroFab®. However, in a study referenced in the package insert, twenty-five of forty-two patients receiving CroFab® experienced some sort of adverse reaction. Most of these were urticaria (7). One of these had an "allergic reaction" consisting of wheezing, dyspnea and urticaria - which sounds a lot like anaphylaxis.

CroFab® is approved by the FDA for use in mild and moderate envenomation. It is not approved in severe snakebite. One assumes the reason is that during clinical trials, equine antivenin was available as an alternative, so the legal implications of giving an experimental treatment when an efficacious one already exists were unsurmountable. CroFab® should work for severe in addition to mild and moderate bites.

The dosing schedule for CroFab® is complex. Four to six vials of CroFab® are mixed in 250 milliliters of saline, and a test infusion of about eight milliliters over ten minutes is given. If the patient has no untoward reaction, the remainder is given over one hour, with close attendance.

The patient should be observed for worsening of symptoms over the next hour. If swelling continues or other signs worsen, the patient should receive a second four-to-six vial dose. The patient is then monitored for at least twenty-four hours. Every six hours, an additional two-vial dose may be given until progression is arrested, up to eighteen hours.

The product must be stored at 4 - 8 degrees Centigrade, but not frozen. When reconstituted, it must be used within four hours. Currently, CroFab® costs (Federal price) several hundred dollars per vial.

Envenomation -- The gift that keeps on giving

Recovery from crotalid envenomation, even with antivenin administration, is unpredictable. Two major problems surface after treatment: delayed coagulopathy and serum sickness. Both can be extremely serious.

Delayed coagulopathy can occur anytime in the first week after the antivenin treatment, and is thought to represent a continuation of the original bite. Essentially, the thinking is that venom is still present in depot form and continues to leak from the bite site. Thus, after all the circulating venom, or venom-antivenin complexes are cleared, the patient receives more venom in a delayed-release form. These patients can spontaneously begin bleeding from the gingival and elsewhere. Treatment is supportive until the bleeding stops.

Approximately one week after administration, many, if not most, patients who receive equine antivenin will complain of aching in several joints, lymphadenopathy, rash, and headache. This is serum sickness. The condition is caused by deposits of immune complexes on endothelium, such as the lining of blood vessels. Treatment is relief of pain.

There I Was

For Pilots Shot Down Over North Vietnam, the Way Home was Jolly and Green.

Robert A. Hanson

Editor's Note: At first read, the following story might be interpreted as something more appropriate to the fighter pilot's world than to the study of the SOF medical mission. Such an assumption would deny the reader valuable insights

We who rush in to rescue those who are shot down in situations similar to this, are usually (and understandably) so wrapped up in the operation confronting us that we may not fully understand what events precipitated our arrival on-scene. It's important for us to be aware that the who pilot just ejected probably didn't do it merely because he was bored with the "routine" of combat aerial flight and wanted a freebie ride home on a Jolly Green or whatever platform might pick him up. In reality, he (a) has probably just gone through one hell of a barrage of ca-ca that he undoubtedly thought would never hit him, (b) is in a whole world of his own as he mentally replays (on continuous loop) the events that lead him to his present predicament, and (c) is probably of the immediate realization that, indeed, he is not as invincible as he used to brag that he was at the O Club bar. In other words, his A&O may be pretty erratic, and his predictability may be pretty unpredictable.

Rescuers--PJs, SEALs, SFs, Recon, etc--need to be cognizant of this fact. Some survivors (targets) are immensely reliable and have their "sierra" in one sock, some are not; some are mobile and can/will move to wherever they're commanded, some are not--not always to sustained injuries but to a gripping fear so severe they are physically immobile; and some are so traumatically trashed that any mobility is impossible.

This is the story of one who had his "sierra" together, and by analyzing the events through the current SOF perspective, it provides an excellent window to future aerial combat rescue operations.

Wayne Fisk

Frank Tullo has never forgotten his first day as a captain. He was 25 years old and flying from Korat Royal Thai Air Base, one of two F-105 bases in Thailand. News of his promotion had come through late the evening before, and he had sewn a pair of shiny new captain's bars on his flightsuit. He was wearing those bars when North Vietnamese gunners on the outskirts of Hanoi shot him down.

I heard Tullo's story a few years ago when he was an airline captain and I was negotiating the sale of radios to his airline. I flew 122 missions in F-4E Phantom IIs, also out of Korat, but at a later time in the war. Many of my friends had been shot down over there, and a lot were never heard from again. Most fighter crews were not optimistic about their chances for rescue.

Pilots of the F-105 Thunderchief, or "Thud," in particular, suffered a high loss rate. There was a standing joke among the often chain-smoking Thud crews that the definition of an optimistic Thud driver was one who thought he would die of lung cancer. In fact, the Air Force commissioned a study that showed that during a typical 100-mission tour, an F-105 pilot should expect to get shot down twice and picked up once. At about the time that Tullo got his captain's bars, air rescue planners decided to try to improve the pilots' chances.

On July 27, 1965, Tullo was flying as Dogwood Two in a flight led by his good friend Major Bill Hosmer, a former Thunderbird and the best pilot Tullo had ever flown with. Dogwood was to be the cleanup flight--the last of 24 F-105s, six flights of four, from Korat to hit surface-to-air missile (SAM) sites in North Vietnam. Their job, as cleanup, would be to take out any sites not destroyed by the earlier flights.

The SAM had introduced a new aspect to the war only days before, when an F-4 Phantom II became the first to fall to these new weapons. The missiles were fired from within a no-fly zone near Hanoi, previously immune from attack as dictated by rules of engagement. Tullo's flight would be part of the first attack within the no-fly zone and the first major strike on the SAM sites since the Phantom had been downed.

To destroy the missile sites and take out their command and control centers, each Thud was loaded with two pods of 2.75-inch rockets (they were also equipped with an internal 20-millimeter Gatling cannon). Along with the rockets, the Thuds carried 450-gallon auxiliary fuel tanks under their wings. Tullo's aircraft, which was scheduled to be flown to Okinawa for maintenance, also carried a 600-gallon tank on its centerline. He'd have to jettison the tank once airborne to stay with the flight.

This was part of a maximum effort involving at least 48 F-105s--24 from Korat and 24 from Takhli--and another 50 or so supporting aircraft. At this early stage of the war--the buildup of US fighters in Thailand and South Vietnam had begun only six months before--tactics and weapons for dealing with SAMs had not been developed. The projected learning curve for the months ahead was nearly vertical.

It was mid-afternoon when Tullo's flight came over the hills from the south to clean up leftover targets. Dogwood flight had been listening to the action on the assigned attack frequency since an in-flight refueling midway enroute. From the sound of things, some friendly aircraft were down. As the flight cleared the last ridge at treetop level before arriving at the target area, Hosmer, who was Dogwood Lead, exclaimed, "Jesus!"

Working to hold his position on Lead's wing, Tullo managed to steal a look ahead. "I damn near fainted," he told me years later. "To a good Catholic boy, this was the description of hell." The whole valley was a cauldron of flame and smoke from the ordnance dropped by preceding flights, and North Vietnamese Army flak filled the sky. In the five months he had been in the war, Tullo had seen his share of anti-aircraft artillery, but this was the worst yet.

Hosmer had the flight on course for the first SAM site they were to check out. Tracers were flying past the canopies and the smell of cordite was strong--the pilots depressurized their cockpits when they neared the target area so that if hit, smoke from an onboard fire would not be drawn inside. Only days before, Tullo had seen a column of smoke stream from his wingman's still-pressurized cockpit after the canopy was jettisoned prior to ejection.

The flight pressed lower. The Thud would do nearly 700 mph on the deck. Tullo was sure they were under 200 feet and was working hard to stay in position on Lead. Without warning, Hosmer broke hard left, exclaiming "Damn, they just salvoed!" Sometimes SAM batteries would fire all their missiles at once in an effort to save the valuable control vans. Tullo could see only the huge wall of smoke and flame coming at the flight from the NVA guns protecting the SAM sites.

Their tremendous speed caused the flight to turn wide enough to be carried directly over the gunsite. As they passed over, Tullo looked right into the flaming muzzles of a battery of quad guns. They were at 100 feet or lower, and still near 700 mph. He glanced over at Lead to check his position, then back into his cockpit. That's when he noticed the fire warning light.

"Lead, I have a fire light," he radioed.

Three called, "Two, you're on fire. Get out!"

Hosmer kept the flight in the turn, saying,

"Two, loosen it up. I'm going to look you over."

Tullo assumed the lead and headed for the mountains in the distance. Hosmer said, "Better clean off the wing, Frank." To give himself more speed and maneuverability, Tullo jettisoned the tanks and rocket pods on his wings and felt the Thud lighten.

Three was calling again, his voice tight with urgency. "Two, the flames are trailing a good 150 feet behind you. You better get out!" In spite of the fire and the calls from Three, Tullo felt a sense of well-being. He was still flying, he had control, and he was with Hosmer. Nothing bad would ever happen with Hoz leading. It would work out. The fire would go out, the aircraft would keep flying, he would make it back. They were still over Hanoi. Houses were below them. The mountains to the west, which would come to be known as Thud Ridge, offered refuge. A good bailout area, just in case.

"You better get out, Frank, it's really burning," Hosmer said in a calm voice.

"Negative," Tullo replied. "It's still flying. I've lost the ATM [the noisy auxiliary turbine motor, which provided the Thud's electrical power but left many of the aircraft's pilots with bad hearing], but I've got the standby instruments, and I'm heading for that ridge straight ahead."

In the early days, several pilots whose aircraft were on fire ejected over the target and were either killed or taken prisoner. There had been incidents in the Thud's checkered past when a burning aircraft had exploded before the pilot could eject, but many others had flown for a considerable time without blowing up. Many pilots, like Tullo, had decided to take their chances staying with their aircraft as

long as they could, rather than eject in the target area.

The ridge was still well ahead of the aircraft. The flight had climbed some but was still very low and being shot at from all quarters. Tullo's aircraft dropped its nose slightly. He pulled back on the stick. No response. He pulled harder. Still nothing. When he heard muffled explosions in the rear of the aircraft, Tullo hit the mike button: "I've gotta go, Lead. I'm losing controls. It's not responding." At 200 feet, there was no time to wait. If the aircraft nosed down, physics would be against him. Even if he managed to eject, he would likely bounce just behind the aircraft, still in the seat. He pulled up the armrests, which jettisoned the canopy, locked his elbows in the proper position, and revealed the trigger that fired the seat.

The results were the most horrific Tullo had ever experienced. At the speed he was moving, the noise, the roar, the buffeting--it was unbelievable. Everything not bolted down in the cockpit went flying past his face. He froze for a matter of seconds before he squeezed the trigger to fire the seat.

The ejection process that followed was so violent that today Tullo's memory is blank of everything that happened immediately after he squeezed the trigger. He doesn't remember leaving the cockpit, the seat separating, or the chute opening. He had the low-level lanyard hooked, which attached the parachute directly to the seat and caused it to deploy almost immediately. After tumbling violently, whomp!, he was swinging in the chute.

A little battered by the violent ejection, Tullo prepared for the landing. Floating down in the chute was serene and the soft rush of air soothed him. He did not see his aircraft crash. During his descent, he eyed the city of Hanoi about 25 miles away. A small U-shaped farmhouse sat near a clearing, just to the west. He passed below the 100-foot treetops and landed in an area of 10-foot elephant grass.

At that moment, listening to the sound of his flight disappearing to the southwest, the only thing in his mind was that he was on the ground in North Vietnam, armed only with a .38 Special. His first concern was to hide the billowing white parachute. Working hard to control his breathing, he stuffed the parachute under the matted grass and covered it up with dirt. After shedding his harness and survival kit, he removed the emergency radio from his vest, extended the antenna, and prepared to contact Dogwood flight. He could hear them returning, and he had to let them know he was all right.

As the flight drew closer, Tullo turned on the survival radio. Cupping his hand around the mouthpiece, he whispered: "Dogwood Lead, this is Dogwood Two." Hoz responded immediately: "Roger Two, Lead is reading you. We're going to get a fix on your position."

The flight turned toward Tullo, who had landed on a hillside west of Hanoi. He could hear heavy anti-aircraft fire to the east and see puffs of flak dancing around the flight. Within seconds, hot shrapnel began to fall around him.

"Frank, we gotta go. Fuel is getting low, and we've been ordered out of the area. We're gonna get you a chopper." Hosmer's voice dropped: "And, Frank," he said, "this may be an all-nighter."

Tullo rogered Hosmer's message and told him he was going to try to work his way higher up the slope to make the pickup easier. He had no doubt that he would be rescued.

As the sound of Dogwood flight faded to the southwest, Tullo prepared to move up the hill to a better vantage point. He decided to open the survival kit and remove useful equipment. In a normal ejection, once stabilized in the chute and prior to landing, a pilot would reach down and pull a handle on the kit's box to deploy it. It was advisable to deploy the kit prior to landing to avoid possible leg injuries, since the case was hard and fairly heavy. Tullo hadn't had this option because he had ejected at such a low level. He rotated the kit's red handle, and with a great whooshing roar, a dinghy began to inflate.

The dinghy! He had forgotten all about that! And it was bright yellow! He had to stop the noise. Tullo drew a large survival knife he wore strapped to the leg of his G-suit, threw himself on the dinghy, and began stabbing it. The first two blows merely rebounded. With a final mighty effort, he plunged the knife into the rubber and cut a large hole so the air could escape. With that emergency solved, Tullo lay back to catch his breath and get a drink of water. Then he started up the hill.

The elephant grass was so dense that at times he couldn't separate it with his hands and had to climb over the tough, wide blades. After climbing about 50 to 75 feet, he realized he wasn't going to make it to the top. His flightsuit was soaked, and his hands were cut by the sharp edges of the grass. Rather than waste more energy, he flattened out a small space in the grass and faced southeast to have a good view of any threat coming up the slope. Time to set up housekeeping.

Tullo's survival vest and kit included a spare battery for the radio, emergency beeper, day and night flares, pen flares, six rounds of tracer ammo, a

"blood chit" printed in several languages that promised rewards for assisting downed American airmen, gold bars for buying freedom, maps, a first aid kit, water purification tablets, two tins of water, two packets of high-energy food, tape, string, 250 feet of rappeling line, a saw, knife, compass, shark repellent, fishing kit, whistle, signaling mirror, sewing kit, and two prophylactics for keeping ammunition or other equipment clean and dry.

He extracted the ball ammo from his .38, loaded the tracers, and stuffed everything not immediately useful into the knapsack-type pouch. Then he sat back, tried to relax, and waited for the rescuers he knew would come. Tullo heard the sound of prop-driven aircraft approaching from the north. He correctly assumed they were Douglas A-1s, or "Spads," as they were called. He stood up and keyed his radio. "This is Dogwood Two, do you read me?"

"Dogwood Two, this is Canasta, and we read you loud and clear. Transmit for bearing." Tullo warned Canasta of the flak to the east, and as advertised, the guns opened up as the aircraft approached Tullo's position. As soon as Tullo could see the aircraft, he began giving vectors. On the second circle, Tullo was looking right up the wing of Canasta, a flight of two Navy A1-Hs. He called, "Canasta, I'm right off your wingtip now." Canasta Lead said, "Gotcha! Don't worry, we're going for a chopper." As the Spads droned out of the area, Tullo felt sure he would be picked up.

Within a few minutes, he heard the unmistakable sound of Thuds. Thinking it could be Hosmer again, he turned on the survival radio and called, "Any F-105 over Vietnam, this is Dogwood Two." An answer came from a flight of two Thuds, which approached his position in a wide sweeping turn from the north. The flight Lead, whose voice Tullo recognized, asked Tullo to pop a smoke flare for location.

"Smoke?" Tullo replied. "Are you out of your mind? There's no way I'm going to pop smoke here!"

The pilot told Tullo to calm down. He had just spotted trucks unloading troops to the south of Tullo's position. He also reassured Tullo that they were working on getting a helicopter to him.

Tullo heard shots. They built to a crescendo, then stopped. The shooting had started at some distance but had grown closer. Soon he was able to hear voices as the troops worked their way up the hillside. He burrowed into the dense grass and waited, his heart pounding. He raised his head and saw an older man about 150 to 175 feet away wearing a cone-shaped straw hat. It was all Tullo could do not to make a run for it, but that was exactly what they wanted him to do. He forced himself to sit quietly. The troops made a lot of noise but they kept moving to the east, down the hill. Silence returned and Tullo continued to wait.

George Martin was flying his Sikorsky CH-3C helicopter to Lima 36, a remote staging area in Laos about 120 miles from Hanoi, to prepare for another day of rescue alert duty. Only a few weeks before he had been flying cargo support at Eglin Air Force Base in Florida. Today, he was commanding a small detachment of men and helicopters on a 120-day assignment in Vietnam. He and his crew had been tasked to learn a new mission for which they had little preparation.

In 1965, as the number of US airstrikes and reconnaissance missions in Vietnam multiplied, pilots faced the increasing possibility of being downed deep inside Laos or North Vietnam. Crews flying the small and slow Kaman HH-43 Huskie, originally designed as an air-base firefighting and rescue helicopter, were already pushing the aircraft to its limits. There was clearly a need for a faster rescue helicopter with longer legs. The cargo-carrying CH-3C fit the bill, and the Air Force began sending crews from Eglin for specialized training. The crews practiced mountain flying, ground survival, and rescue operations, which involved coordination with controller and escort aircraft. The training was projected to last several months, but the escalating conflict wouldn't wait.

Martin, who was too close to retirement to be selected for the additional training and the accompanying extended tour, was ordered to fill in with 21 men and two CH-3s until the fully trained crews arrived. "I found out Friday afternoon and was gone Sunday evening," Martin says. "It was just like in the movies--I said, 'When do I leave?' They said, 'How fast can you pack?' "

Martin was about to land at an intermediate refueling base when he was asked by radio to divert and try to rescue a downed F-105 pilot. Martin still needed to proceed to Lima 36 to drop off cargo and extra crew. He had to lighten his aircraft to take on as much fuel as possible and still be able to pick up the pilot. "The big consideration in helicopter pickup is gross weight," Martin says. "If you're too heavy to hover, all you can do is fly around and wave at him."

Upon landing at 36, Martin's number two

engine warning lights indicated an "overtemp" condition, which meant significant problems, possibly foreign object damage or a compressor stall from air starvation, and under normal circumstances would have grounded the aircraft. The crew looked to Martin for a decision. "Everybody was pretty apprehensive. I told them, ' We're his only hope. If the engine will start again after cool-down, we'll go.' " His crew reluctantly agreed.

The engine restarted without incident and Martin"s CH-3, call sign "Jolly Green One," took off for Hanoi. Martin had no idea where to locate the downed pilot. He was unescorted until he was about 50 miles from Hanoi, at which point he was joined by Canasta flight, flown by Ed Greathouse and Holt Livesay from USS Midway's Attack Squadron 25.

The oppressive heat of the afternoon wore on. Finally, Tullo heard the sound of prop-driven aircraft again. Darkness was about 40 minutes away as he turned on his radio. The aircraft responded immediately. " Dogwood Two, this is Canasta. I have a chopper for you." Seconds later, Canasta flight flew directly over Tullo's position, and there, not far behind, came a helicopter. Tullo was expecting a small chopper, but this one was a big green monster, Martin's Jolly Green, the first in the theater and headed for its first combat recovery--Frank Tullo. "Dogwood Two, this is Jolly Green. How'm I doing?" Martin said to the man on the ground. He was coming right up the valley from the south-southwest. Tullo said, "You're doing great!" and popped his pen and smoke flares. The chopper's blades made the smoke swirl as Tullo aimed his .38 straight up and fired all six tracer rounds. Crew chief Curtis Pert spotted the pilot through the thick ground cover as soon as the smoke made its way above the trees. As Martin hovered, Pert lowered a "horse collar" sling.

Later, better equipped rescue crews would have a specialized hoist attached to a "jungle penetrator" designed to pierce thick tree canopies. "We just had a jury-rigged cargo winch that you could turn into a 10-cent, Mickey Mouse rescue hoist," Martin says.

On the ground, the downblast was tremendous. Debris flew everywhere, and the trees and grass were whipping and bending wildly. Tullo holstered his pistol, slung the survival kit over his shoulder, and slipped the horse collar over his head. He gave the crew chief in the door a thumbs-up.

The cable became taut and Tullo began to rise off the ground. After being lifted about 10 feet, the hoist jammed and the cable stopped. The crew chief was giving hand signals Tullo did not understand. Tullo looked up. Pert and pararescueman George Thayer were in the door lowering a rope. The horse collar was cutting off the circulation in Tullo's arms and he was tiring, but he grabbed the rope and tied it around the top of the horse collar.

Finally the chopper began to move and dragged Tullo through some bushes. Everybody's trying to kill me, he thought. The Jolly climbed and circled as Pert Thayer struggled with the hoist. The overworked number two engine had begun to overheat and a fire light came on in the Jolly's cockpit. As they circled, Martin hoped that the air flowing through the engine would cool it down and the light might extinguish.

Pert and Thayer were joined by copilot Orville Keese, and the three men strained to pull the dangling man aboard. The pain was becoming so great that Tullo was thinking about dropping from the sling.

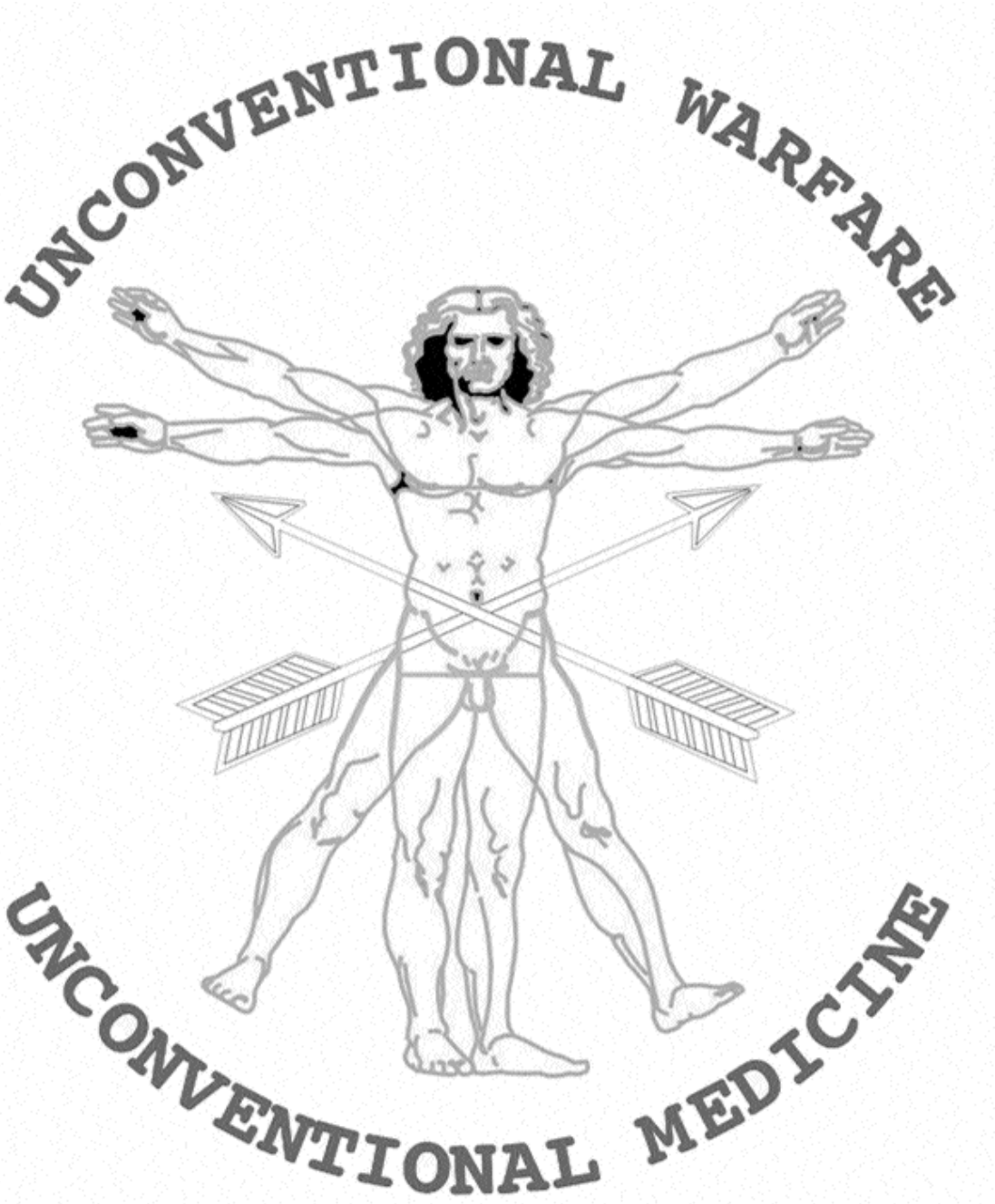
Martin spotted a rice paddy next to a house and lowered Tullo to the ground. The exhausted pilot rolled out of the sling as the chopper swung away and landed 50 or 60 feet away from him. Pert and Thayer frantically shouted to Tullo, who sprinted and dove through the door. He could hear an automatic weapon firing and saw both pilots in the helo ducking their heads.

The Jolly had problems: low fuel, a sick engine, darkness, and clouds at altitude. Martin and his crew had been in the war zone slightly more than two weeks and did not even have maps of the area. The crew relied on flares lit inside 55-gallon drums at Lima 36 and the landing lights of hovering helos to find a place to land. "We held only about a quarter of the area around the site," Martin says. " That was the only corridor you could fly through without getting shot at, because the Pathet Lao held the other three-quarters." Martin finally landed with a shaken pilot and just 750 pounds of fuel aboard.

Tullo learned his aircraft was one of six Thuds and one EB-66 electronic countermeasures aircraft shot down that day. Of three surviving pilots, Tullo was the only one rescued--the others were to spend more than seven years as POWs. Tullo returned to a Thunderchief cockpit and completed his tour. His story was later told in *Thunder From Above* by John Morocco.

Tullo's rescue was the farthest north that a successful pickup had been made, thanks to the determination of Martin and his crew and the long range of their CH-3C. It was the first of 1,490 recoveries that Jolly Green Giants would make in Southeast Asia.

Soon a dedicated air rescue version would be built, the HH-3C, with in-flight refueling capability, armor plating, a powerful hoist, and shatterproof canopies. However, the Jolly Green Giant would find its ultimate form in the HH-53 Super Jolly, an even larger and more powerful helicopter still flown in various versions today. The technology improved, but rescue crews still had to meet the same basic requirements: a willingness to fly into hostile territory, hover in a big green target, and find a man whose only hope arrived on a cable and sling.



Inside a Special Forces Unconventional Warfare Clinic - Afghanistan

SFC Rojzet Von Stankavitch

During four months of duty in one of the most remote regions of the world Special Forces medic, SFC Doc Maui (AKA Kurt Schnupp), treated over 4000 patients with ailments ranging from leprosy and leishmaniasis to gut-wrenching diarrhea outbreaks, deformities, gunshot wounds and major trauma.

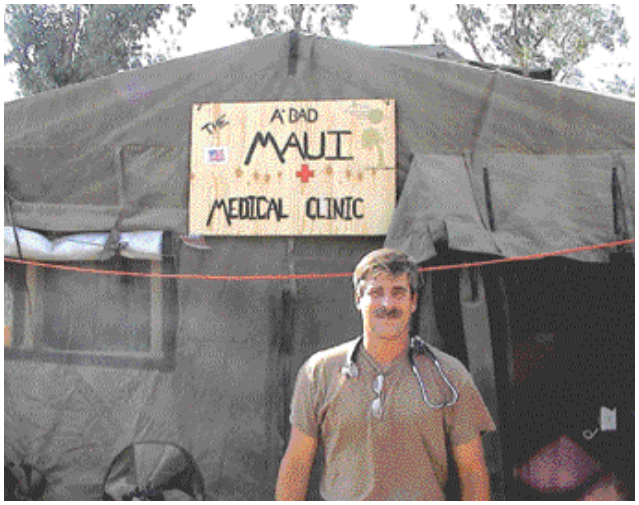
The thick nylon straps dug deep into my shoulders under the immense weight of my ammunition-laden rucksack. Each step could potentially be my last. Walking off the steep mountain in northeastern Afghanistan was no cakewalk for my team of three where we had just spent four days on a freezing hilltop looking for Al Qaeda terrorists walking the trails at night from across the Pakistani border.

The dirt goat trail was wickedly narrow and rounded at the surface. To the right, a fecal infested stream hugged tightly the bottom of a 2000 ft mountain face. To the left, a 100 ft bone crushing drop to our deaths.

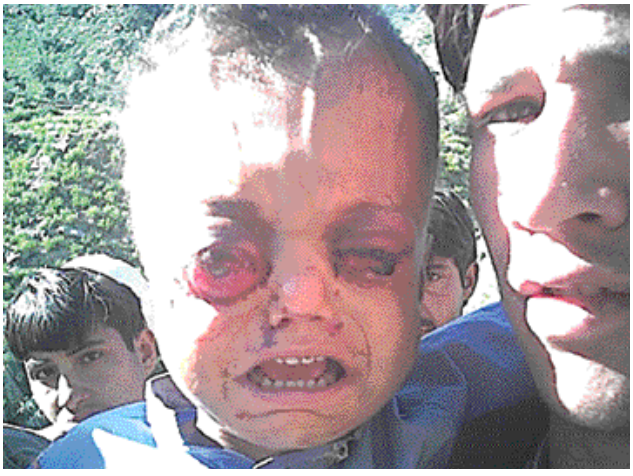
After an agonizing one and a half hour hump down the mountain we stopped at a village that time seemed to have forgotten. A thousand years ago the scenery would have been no different - dirt trails, stone walls, goats roaming the rocky hills munching on wild cannabis, donkeys carrying loads that made my knees buckle on sight, and mud and rock dwellings built into the inhospitable terrain.

On the trail "Hollywood," "Legend", and I met up with a village elder en route back to our pick up point. With a day to burn we decided to spend the cold morning semi-relaxed beside a feet-thawing fire. Within minutes there were over a dozen Afghani gargoyles squatting on rocks around our position seemingly fascinated by our every move. Hollywood showed them how to juggle as I practiced my broken Pashto. We were today's stars on what is popularly known as "Hajivision." The elders brought us green river-water tea, fried goat and their version of bread. Legend popped a Cipro.

Within the hour a white-bearded old man approached us with a small child in his arms. The boy's eyes were fire-red and swollen shut with dried pus. The deformed features and his pathetic cries made Hollywood, the demo SGT, shudder and walk away. The man handed me some paperwork and an ultrasound, which had been taken at a hospital in Peshawar, Pakistan. It showed a large tumor growing behind the child's right eye. With no room to grow it caused his eyes to bulge from their sockets.



Doc Maui in front of his clinic



A large tumor is growing behind the child's right eye

It's nothing like I had seen in the States, or even Latin America for that matter.

There was nothing I could do there, so I wrote a script for the man and told him to take it to our firebase 25 km away and talk with Doc Maui. He smiled nodding his head and said that the people of his village had also informed him of a clinic where Americans were healing people. He agreed to show up the day after tomorrow and then proceeded down the trail.

The War on Terror has opened a door to history bringing to center stage the US Army Special Forces (Green Berets) with their specialty of unconventional warfare (UW). With it comes obvious missions that involve learning the customs, culture and language of an indigenous people in order to live with, train, and fight along side them. However, to enable a foreign military to be completely effective in a long-term UW operation it frequently needs the support of the local population who can provide timely intelligence on the enemy.

One way to accomplish this is to win the hearts and minds of the "indig" proving that we are not there to occupy, but to work with them in stabilizing their country. At the forefront of this campaign is health care, especially in a country as poor as Afghanistan where many people have never been to a doctor in their life. In steps Doc Maui.

During OPERATION ENDURING FREEDOM Doc Maui was given the daunting task of establishing and operating an unconventional warfare clinic for American soldiers and the local indigenous population in northeastern Afghanistan. During four months of operation Maui Clinic treated over 4000 patients with a plethora of ailments ranging from common illnesses and injuries to diseases such as leprosy and leishmaniasis, gut-wrenching diarrhea outbreaks, deformities, gunshot wounds, and other types of major trauma.

"Hey, I need you to come down to the clinic and help me with sick call tomorrow morning," Doc Maui said with a steaming-hot cup of coffee in hand. "No problem," I said, "I'll see you at 0630 by the front gate." As a Special Forces medic I've grown accustom to blood, guts and a wide range of illnesses, but what I saw, and smelled, at the front gate that morning is forever etched into my brain housing group.

"We've been treating this guy for leprosy," Doc Maui said so matter-of-factly. "Go ahead and change his bandage. And check the smell to make sure there's no gangrene growing." As I tenderly unrolled the Ace wrap that covered the day-old gauze



Results of leprosy

dressing, I held back vomit at the sight before me as the thick putrid smell permeated my nostrils. It wasn't the smell of gangrene; it was simply the smell of exposed pink and white flesh with the three middle toes rotted off his foot. As the man pulled back his nubs enabling me to clean the wound two worms popped out of a hole that used to be a toe. One fell onto the dirt and I called Doc Maui. "Hey, is this guy supposed to have worms coming out of his feet?" Then the obvious answer - "Negative." After cleaning the wound with the typical Maui Mix of betadine, sodium chloride and antibiotics and bandaging it, we told him to come back the following day and sent the old man hobbling on his way. The evening's research revealed that the worms were maggots that had to come out. "That's just great," I said while choking down the sergeant major's evening chow, "A flesh rotting leprositic foot with worms coming out of it."

As I looked to Doc Maui for a little emotional support he said, "That's nothing, let me show you something on my computer in a bit." After chow he read me the patient log - "Burns, leishmaniasis, tuberculosis, three amputations, gunshot wounds, pneumonia, deformed leg, herpes, syphilis, malaria, and more leprosy," he said. "That's great, I can't wait until tomorrow," I said with a hint of sarcasm. I bid him farewell and told him that I'd be in the next morning to spend the day in the clinic.

As I walked in at 0630 Doc Maui was already at work sewing up the face of a boy who had had his nose bitten off by a dog. "This is somewhat of a challenge," Doc Maui said. "Trying to get the cosmetics



Young boy being treated for burns

just right. Not like he's going to be in GQ or anything, but I just want to get it on there straight. One thing that I am concerned about is massive infection, so we're going to have him come back everyday for a week for wound care and to ensure he's taking the medication properly," he concluded.

Doc Maui explained his SOP (Standard Operating Procedure). "We try not to hand out more than a two day supply of meds to the locals, because they either go down to the local pharmacy and sell them or stop taking them as soon as they start feeling better and then use the meds for something other than their original intention. We're especially concerned about the kids, because sometimes the parents will take the meds themselves, and especially with the little girls; they will take their meds and give them to the boys. It's amazing!"

"But, this clinic is doing a lot of good," he said. And Intel reports definitely back up that statement. Before the development of the hospital our convoys were getting attacked by Improvised Explosion Devices (IEDs) on a regular basis and our firebase was getting rocketed. After about a month in operation, Doc Maui and his clinic were a major contributing factor in markedly reducing those attacks. The word had spread throughout the province - "If you need treatment come to the firebase; if you don't want the clinic to be closed, then help us find out who has been attacking our troops."

There were also numerous emergency trauma cases. One boy who had been playing with a mine that exploded in his face was rushed to Maui Clinic. Doc Maui and another Special Forces medic worked on the 6 year old which saved his life. In another instance a man from an opposing clan seeking revenge had shot a teenage boy in both feet; without immediate care he would have become a double amputee. One night a man was driven up to the gate with a gunshot wound to the chest. He wouldn't have made it to the hospital four hours to the south, so Doc Maui performed advanced trauma life support before evacuating him by chopper to Bagram Air Base for further treatment. These are just a few of the emergency cases seen in the UW clinic. "And, the clinic's got a 100% survivability



Boy treated for a gunshot wound to the chest

rate," Doc Maui says proudly before continuing; "Well, that one guy at the gate doesn't count because he never made it inside."

"In a UW environment," Doc Maui explains, "one of the medic's most important roles is Preventive Medicine (PM)." Without a doubt the biggest crippler on the firebase has been severe diarrhea outbreaks. Doc Maui usually gets to know who's new at the firebase, because they often spend the first week visiting him at the clinic for IVs (intravenous injections) with a twist of Phenergan and Cipro.

On his way to the local hospital, Doc Maui said "It's great to be able to provide medical treatment to the Afghan people, but the best way we can help is to teach them to take care of themselves." He does this by teaching basic and advanced medical procedures to the doctors and other health care providers. As Doc Maui explains, "Some of the most challenging aspects of providing medical care in Afghanistan are associated with cultural issues."



Inside the Maui Clinic



Although we're not here to judge the people or change a culture, the differences between our two cultures frequently makes treatment difficult as well as occasionally amusing. "Treating people during Ramadan (the annual Muslim holy time) was really interesting" Doc Maui recalls. "For a month they don't eat, drink, or consume anything from sunup to sundown and then stuff their faces all night. They come to the clinic with heartburn and indigestion with headaches from dehydration, but can't take medications or even drink water for that matter; initially, they wouldn't even allow me to administer injections" he said.

"One day a Burka clad woman came in with a really nasty infection on her hand that needed immediate antibiotic therapy. She had been to the local hospital nine times without success. Through the interpreter, I explained to her and her husband that it was either 2 grams of Mefoxin IV or her hand was basically going to turn black and rot off her arm. After a great deal of persuasion they finally agreed to treatment and we were able to save her limb," Doc Maui happily reported.

"I finally had to go to the local holy man to grant permission for treatment. Sometimes it worked," he said with a smirk. "I'll tell you though, the mere fact that women are coming in for treatment is a clear indication of the trust that the Afghan people have developed for the US soldiers."





Doc Maui said, "But the way to make the biggest difference in Afghanistan is through the children. They're the future of this country. After 30 years of bloody wars, the older generations are set in their ways. But the children, since they've been coming into the clinic I can already see a change in them; it's like they have more hope."

What a way to finish out a 26-year active duty and National Guard career. During his final year of military service Doc Maui established 20th Special Forces Group's first ever UW hospital. During this time he saved dozens of lives and represented the United States in the way that makes Americans proud of their soldiers and of their country. It's now time for Doc to get back to his family and engage in his second passion--ripping through Monster Surf…can you guess where?



The following is an compiled list of SOF related books recommended for your reading by those that were there. The list is complements of Len Blessing with the assistance of all of you. If anyone has other books they would like to add to the list, let us know. Three new books have been added since the Fall Edition.

TITLE	AUTHOR
15 Months In SOG	Thom Nicholson
A Concise History of US Army Special Operations Forces, with Lineage and Insignia	Geoffrey T. Barker
A Very Short War (about the last gunfight and the last sacrifices of the Vietnam-era war in the recovery of the crew and ship SS Mayaguez in 1975)	John F. Guilmartin, Jr
Advice and Support: The Early Years	Ronald H. Spector
Airborne and "Special Forces" (non-fiction, good quick references, especially for family or civilians)	Hans Halberstadt
Battle for the Central Highlands: A Special Forces Story	George E Dooley
Beyond Nam Dong	Roger Donlon
Blacjack -33: With Special Forces in the Viet Cong Forbidden Zone	James C Donahue
Blackjack -34 (Previously titled "No Greater Love")	James C Donahue
Bravo Two Zero	Andy McNab
Break Contact Continue Mission (fiction)	Raymond D. Harris
Bunard: Diary of a Green Beret	Larry Crile
Che Guevarra on Guerrilla Warfare	Ernesto Gueverra
Code Name Bright Light	George J. Veith
Code Name:Copperhead	SGM Joe R. Garner (Ret.)
Covert Warrior	Warner Smith
Edward Lansdale: The Unquiet American	Cecil B. Currey
Elite Warrior	Lance Q. Zedric
Fighting Men: Stories of Soldiering	Jim Morris
Five Year To Freedom	James N. Rowe
From OSS to Green Berets	Col. Aron Bank (Ret)
Ghost Soldiers: The Epic Account of World War II's Greatest Rescue Mission (Ranger operation to free POWs in the Philippines)	Hampton Sides
Green Berets At War	Shelby L. Stanton
Green Berets at War: US Army Special Forces in Asia 1956-1975	Shelby L. Stanton
Green Berets in the Vanguard: Inside Special Forces 1953-1963	Chalmers Archer Jr
Guerrilla Warfare: On Guerrilla Warfare	Mao Tse tung
Hard To Forget	Steven M. Yedinak
Hazardous Duty	MG Jack Singlaub (Ret)
Ho Chi Minh: A Life	William J Durker
I Served	Don C. and Annette R. Hall
In The Village of the Man	Loyd Little
Inside Delta Force: The story of America's elite counterterrorist unit	Eric L. Haney
Inside the Green Berets: The First Thirty Years	Charles M. Simpson III
Killing Pablo: The Hunt for the World's Greatest Outlaw (read by current SF medic that knows some of the guys involved in getting Pablo; told him that the book is pretty accurate, except what happened in the actual killing.)	Mark Bowden
Laos: War and Revolution	Nina S. Adams (Ed.)

TITLE	AUTHOR
Logistical Support of Special Operations Forces During Operations Desert Shield and Desert Storm	Donald W. Betts
Long Shadows (fiction)	Kent White
Lost Crusade: America's Secret Cambodian Mercenaries	Peter Scott
MAC-V-SOG Command History Vol. I & II	Charles F. Reske
Medal Of Honor	Roy P. Benavidez
Mike Force	L H. Burrus
Mobile Guerrilla Force: Wth the Special Forces in Warzon D	James C Donahue
My Secret War	Richard S. Drury
Night Jungle Operations	Thomas B. Bennett
Night of the Silver Starts: The Battle of Lang Vei	William R Phillips
No Surrender (Japanese soldier who evaded capture and survived 30 years in the Philippines; it's a great book about perseverance and commitment to warrior ideals)	Hiroo Onoda
Once A Warrior King: Memories of an Officer in Vietnam	David Donovan
One Day Too Long	Timothy N. Castle
OSS to Green Berets	Aaron Bank
Parthian Shot	Loyd Little
Peoples' War, Peoples' Army	Vo Nguyen Giap
Perilous Options: Special Operations as an Instrument of US Foreign Policy	Lucien S. Vandenbroucke
Phantom Warriors, Book II	Gary A. Linderer
Phantom Warriors: LRRPs, LRPs, and Rangers in Vietnam, Book I	Gary A. Linderer
Prairie Fire (fiction)	Kent White
Project Omega: Eye of the Beast	Ernie Acre
Rangers at War: Combat Recon in Vietnam	Shelby L. Stanton
Reflections Of A Warrior	Franklin D. Miller
Rescue Of River City	Drew Dix
SF Bibliography: Collection of articles and other readings with Special Forces topics	Radix Press/Dan Godbee
Shadow War: Special Operations and Low Intensity Conflict	H.T. Hayden
Shadow Warriors: Inside the Special Forces	Carl Stiner and Tomy Koltz
Sideshow (the US, Khymer Rouge & Cambodia)	Robert Showcross
SOG and SOG Photo Book	John Plaster
SOG: Volume 1	Harve Saal
Soldier Under 3 Flags	H. A. Gill (PB)
SPEC OPS: Case Studies in Special Operations Warfare: Theory and Practice	William H. McRaven
Special Forces 1941-1987	LeRoy Thompson
Special Forces of the US Army	Ian Sutherland
Special Forces, the US Army's experts in Unconventional Warfare	Caroll B. Colby
Special Forces: A guided tour of US Army Special Forces	John Gresham
Special Men and Special Missions: Inside American Special Operations Forces, 1945 to the Present	Joel Nadel and J.R. Wright
Spies And Commandos	Kenneth Conboy
Strategy and Policy Background Umbrella Concept for Low Intensity Conflict	Alex & Hamilton Booz
Street Without Joy (French in Indochina; Good groundwork for SF in Vietnam)	Bernard B. Fall
Talking with Victor Charlie: An Interrogator's Story	Sedgwick D. Tourison, Jr.
Tam Phu	Leigh Wade

TITLE	AUTHOR
The Chindit War (good section on Merrill's Marauders)	Shelford Bidwell
The Company They Keep	Anna Simons
The Devil's Brigade	Robert H. Adleman
The Dying Place (fiction)	David A. Maurer
The Green Berets	Robin Moore
The Green Berets in Vietnam, 1961-71	Francis J. Kelly
The Last Confucian	Denis Warner
The Making of a Quagmire	David Halberstam
The Montagnards of South Vietnam	Robert L. Mole
The New Legions	Donald Duncan
The One That Got Away (This is the other half of the Bravo Two-Zerostory [a very good read on human endurance and tenacity])	Chris Ryan
The Politics of Heroin in SE Asia (essential reference for understanding the Golden Triangle)	Alfred McCoy
The Protected Will Never Know	Leigh Wade
The Raid	Benjamin F. Schemmer
The Ravens (the classic about our Bird Dog brothers)	Christopher Robbins
The Rescue Of Bat-21	Darrel D. Whitcomb
The Road to Arnhem: A Screaming Eagle in Holland	Donald R. Burgett
The Secret War Against Hanoi: The Untold Story of Spies, Saboteurs and Covert Warriors in North Vietnam	Richard H Shultz Jr
The Secret Wars: A Guide to Sources in English, Volume II, Intelligence, Propaganda and Psychological Warfare, Covert Operations, 1945-1980	Myron J. Smith
Tragedy in Paradise: A country Doctor at War in Laos	Charles Weldon MD
Umbrella Concept for Low Intensity Conflict	Alex & Hamilton Booz
Unconventional Operations Forces of Special Operations	Mark D. Boyatt
Uneasy Warrior	Vincent Coppola
Urgent Fury: The Battle for Grenada	Mark Adkin
U S Army Special Operations in World War II	David W. Hogan Jr.
U S Special Forces	Peter McDonald
U S Army Special Forces 1952-84	Gordon L. Rottman
U S Army Handbook for North Vietnam Dept. of Army: 550-57	
U S Army Handbook for Cambodia Dept. of Army: DA Pam: 550-50	
U S Army Handbook for Laos Dept. of Army: DA Pam: 550-58	
U S Army Handbook for South Vietnam Dept. of Army: DA Pam: 550-55	
U S Army Handbook: Minority Groups in the Republic of Vietnam: Ethnographic Series Dept. of Army:DA Pam: 550-105	
Vietnam Above The Tree Tops: A Forward Air Controller Reports	John F Flanagan
Vietnam in American Literature	Philip H. Melling
Vietnam Military Lore: Legends, Shadow and Heroes	Master Sergeant Ray E Bows (Ret)
Vietnam Order of Battle: A Complete, Illustrated Reference to the US Army and Allied Ground Forces in Vietnam, 1961 - 1973	Shelby Stanton
Vietnam Studies: Command and Control 1950-1969	Maj Gen George Eckhardt
Vietnam: A History	Stanley Karnow
Vietnam: The Origins of Revolution	John T. McAlister Jr.
Vietnam: The Secret War	Kevin M. Generous
War Stories of the Green Berets: The Vietnam Experience	Hans Halberstadt
War Story	Jim Morris
Who's Who From MACV-SOG	Stephen Sherman



The JSOM is my favorite of all the medical journals,. It is practical and reflects the specific needs of our community.

Mike Mouri, MD

Thank you for sending the PDF. It arrived, was printed immediately, and has been in use ever since.

Margaret J. Harrison, MLIS
Librarian
Joint Special Operations Medical Training Center
Library

I feel the layout and final editing of the "Thin Air" article turned out very well. The journal looks and reads at a high professional level.

Eric D. Martin, MD

Our unit medical section practices in a variety of pre-hospital/deployed locations using medical kits/sets issued to us from SOFSA. The information contained in the journal is of GREAT benefit to our providers. The journal comes highly recommended from several of our working partners in SOCOM. Thanks.

Scott Frazier
CPT, MS, NREMT-P
Medical Operations & Logistics Officer

I received the Fall 2002 Journal. Please continue the good work. The Journal has provided my unit with some very important and useful insight and training ideas. Thank you for including us.

SFC Howard H. Kittell II

Editorials

CORPUS CAVERNOSUM: AN ALTERNATIVE ROUTE FOR SYSTEMIC CIRCULATION ACCESS

Melville Bradley, MD

I was reading a book entitled Combat Surgeon: Up Front With the 27th Marines by James S. Vedder 2 years ago while I was at the National Training Center (NTC) at Ft Erwin. The book is a narrative about Dr Vedder's experiences while a battalion surgeon on Iwo Jima.[1] He related an interesting method for fluid resuscitation, which I have never heard, when peripheral access and a cut-down may not be possible. The method was to infuse fluids via the corpus cavernosum. I became more curious and decided to hunt down some literature on this method; to my surprise there seemed to be quite a paucity of references available. My assumption was that perhaps most of the literature was outdated and unavailable due to the fact that this was an older procedure which may have fallen out of favor awhile back. I found only three articles, all recent, on the procedure, the earliest from 1995. Two of the studies used only canine subjects while the third utilized both canine and human models.

The first study measured fluid flow rates via the corpus cavernosum along with central venous pressures (CVP) and mean arterial pressures (MAP) in dogs with hypovolemic shock. The article reported that all resuscitations were successful using normal saline as well as haemaccel and whole blood infused via the corpus cavernosum.[2] The second study measured the mean rate of saline infusion via 23 gauge needles inserted into the corpora cavernosum of 5 different mongrel dogs in hypovolemic shock. Measurements in mean systolic pressure and mean blood volume (volume measured per 125I - labeled albumin) during resuscitation phases were also measured and were used to determine the success of the resuscitation.[3] The third study, which was conducted by the Israel Defense Forces (IDF) Medical Corps, used flow rates and pressure monitoring in both canines and humans to determine efficacy. 19 gauge needles were used for insertion into the corpora cavernosum of 10 human males with the investigators making the main outcome measure for success a desirable fluid flow rate (using Ringer's lactate) and the time taken for intracorporeal needle insertion. For their human models they declared success by obtaining flow rates in the upper 80s ml/min, and an average needle insertion time of 15 seconds.[4]

I am curious if any of the readership has heard of this procedure or ever used it in the past. It seems like a great alternative if a cut-down, or other vascular access routes (ie, marrow, peripheral lines, etc), cannot be obtained. Is this procedure taught to the SOF medic community? It appears as though it could be very efficacious in a field environment.

Dr Bradley was Battalion Surgeon, 1-26 IN, Camp Able Sentry, Macedonia 1998 and TF 1-26 Surgeon, Camp Monteith, Kosovo 1999. He served as a TDA Flight Surgeon at Katterbach, Germany. He is presently a DA civilian and is the Installation Medical Authority for the McAlester Army Ammunition Plant, McAlester, Oklahoma.

1) Vedder, James A., Combat Surgeon: Up Front With the 37th Marines, Presidio Press, Novato, CA, 3rd printing 1998.
2) Nicol D, Watt A, Wood G, Wall D, Miller B; Corpus cavernosum as an alternative means of intravenous access in the emergency setting. *Australian and New Zealand Journal of Surgery*. 2000; 70(7):511-4
3) Stein M, Gray R; Corpus cavernosum as an emergency vascular access in dogs. *Academic Radiology*. 1995Dec; 2(12): 1073-7.
4) Gofrit ON, Leibovici D, Shapira SC, Michaelson M, Shofti R, Mordochovich D, Vardi Y; Penile intracorporeal infusion possible access to the systemic circulation: Pressure flow studies in dogs and humans. *European Journal Surgery* 1997 Jun; 163(6): 457-6.

Med Quiz

Arsen M. Pankovich, MD

A 31-years-old man twisted his left ankle in a fall. A metallic splint was used at the scene to immobilize the ankle. What type of injury is this? How do you treat it?

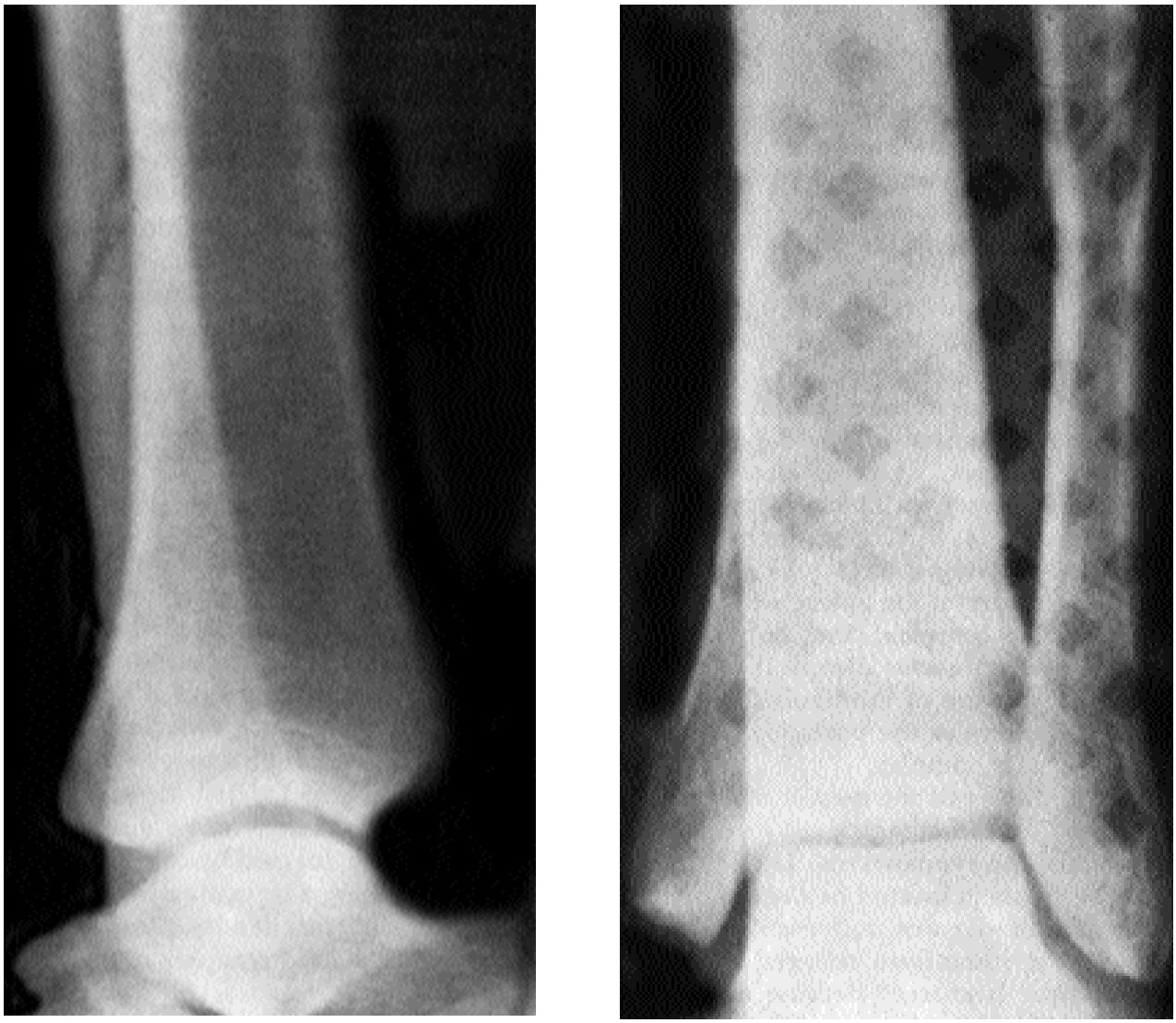


Fig. 1 Lateral and AP views of an ankle fracture.

Answer:
This is an unstable ankle fracture, a pronation-external rotation type, in which, as in all pronation injuries, either the deltoid ligament rupture or a fracture of the medial malleolus occurs first and precedes other lesions (rupture of the syndesmosis, fracture of the fibula and the posterior tibiofibular ligament complex in that order).The fibular fracture occurs some 5 or 6 inches above its distal tip and it is characteristically a short oblique fracture which extends from the posterior edge in an antero-superior direction.

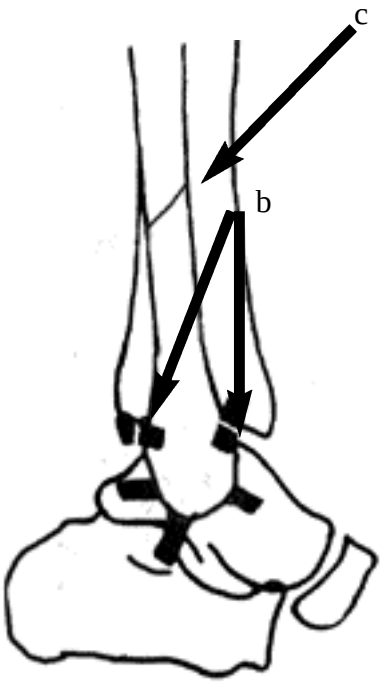
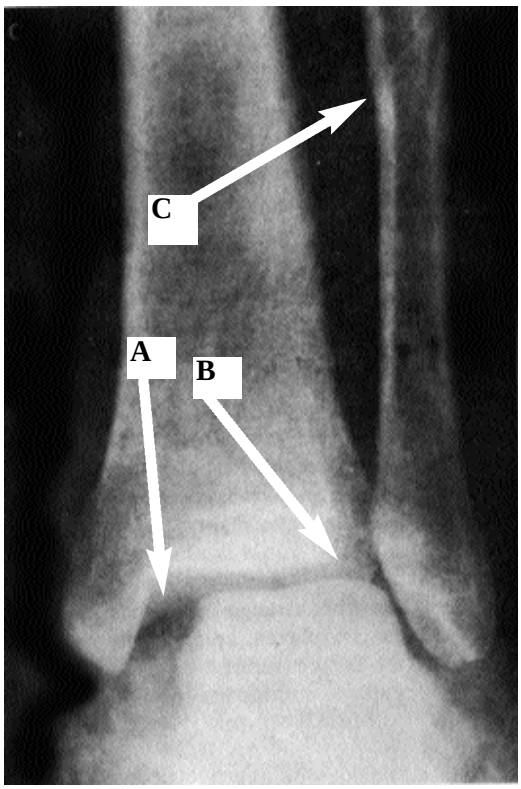


Fig.2a



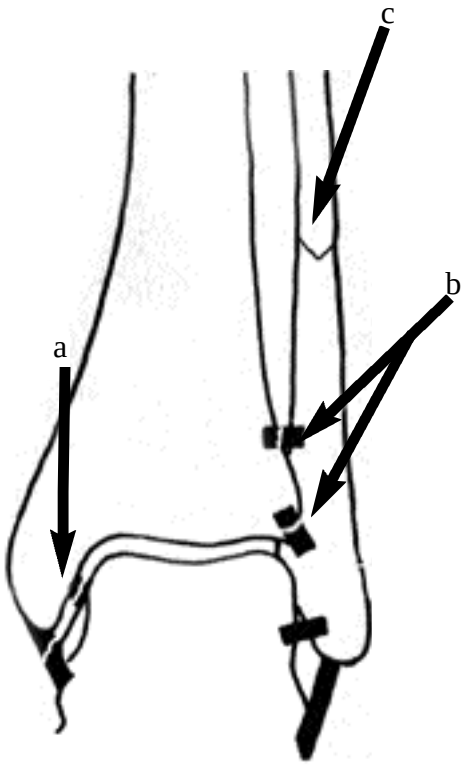


Fig.2b

Fig. 2

Fig. 2. The antero-posterior view of the ankle a week later. Displacement of the fracture fragments is obvious: A. Widening of the medial mortise from rupture of the deltoid ligament and lateral displacement of the talus; B. The fibula is displaced and the syndesmosis widened; and, C. The fracture of the fibula does not appear much different.

Fig. 2a. Schematic drawing of the ligament and bone lesions (lateral view): b. Ruptured posterior and anterior tibiofibular ligaments; and, c. A typical pronation-external rotation (PE) fracture of the fibula.

Fig. 2b. Schematic drawing of the ligament and bone lesions (AP view): a. Rupture of the deep and superficial parts of the deltoid ligament; b. Rupture of the anterior tibio-fibular and interosseous ligaments; and, c. An essentially undisplaced fracture of the fibula.

Three more types of ankle fractures which present with a fracture of the fibula above the syndesmosis exist, as follows:

Pronation-abduction (PA) type. Again, as in all pronation injuries, the deltoid ligament rupture or a fracture of the medial malleolus is the first lesion, followed by a complete disruption of the syndesmosis, which is followed by the typical fracture of the fibula. The fibular fracture is best seen on the antero-posterior view. Again, absence of a fracture of the medial malleolus or widening of the medial mortise, as seen in Fig 3, may be misleading, but obvious, when a PA fracture is recognized. The ankle is unstable and surgical treatment is necessary.

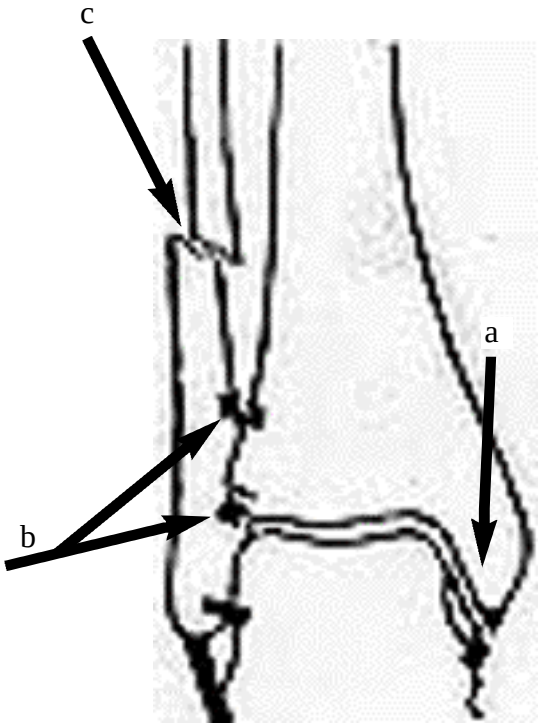


Fig. 3a



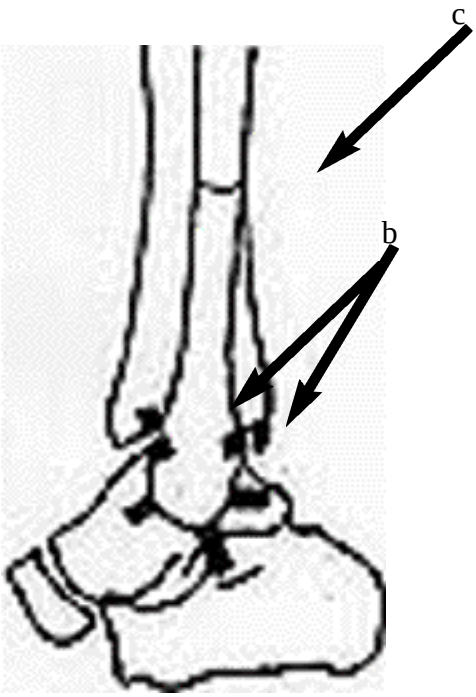


Fig. 3b

Fig. 3

Fig. 3. A typical fracture of the fibula of the pronation-abduction (PA) type. Although the medial mortise does not appear widened, the deltoid ligament is ruptured and surgical stabilization is necessary. Just repositioning the ankle or applying a gentle lateral force on the foot would widen the medial mortise. The typical fracture of the fibula clearly points to the rupture of the deltoid ligament.

Figs 3a and 3b. Schematic drawing of a PA fracture: a. Rupture of the deep and superficial parts of the deltoid ligament; b. Ruptures of the anterior and posterior tibiofibular and interosseous ligaments; and, c. A typical fracture of the fibula.

Supination-external rotation (SE) type. The typical fracture of the fibula extends from the posterior edge in an anterior and distal direction and it is often spiral. The fibular fracture follows the injury to the anterior syndesmosis and is followed in some cases by the injury to the posterior syndesmosis and by a rupture of the deltoid ligament or a fracture of the medial malleolus. This type of fibular fracture occurs also at and below the syndesmosis. If the deltoid ligament and the medial malleolus are intact, which is often the case, the treatment is conservative by immobilization with a short leg cast or a similar commercial version. Weight bearing is then possible after 1-2 weeks. If tenderness on the medial side exists initially, a stress x-ray is advisable to rule out a deltoid rupture.

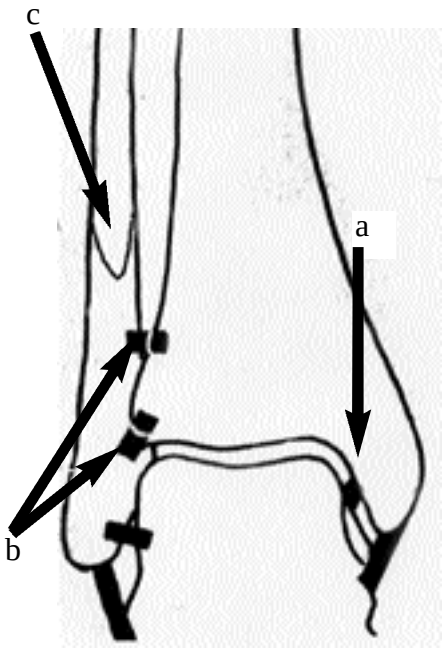


Fig. 4a



Fig. 4

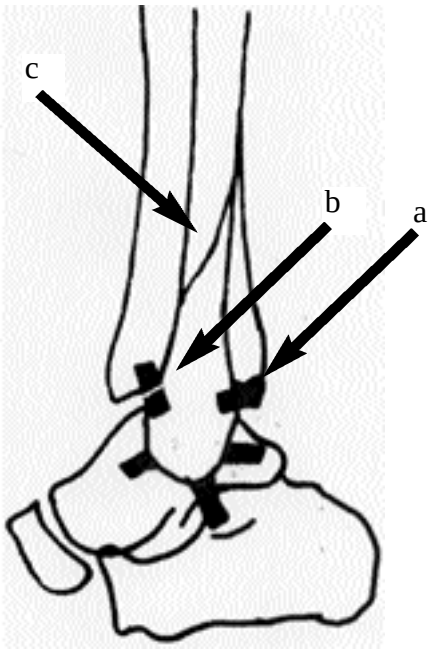


Fig. 4b

Fig. 4. A typical supination-external (SE) rotation fracture of the fibula. The medial side was intact and without local tenderness, swelling, or ecchimosis. Considering the intact deltoid ligament and the medial malleolus, in this case, the ankle is stable and conservative management is indicated.

Fig. 4a. Schematic drawing of a SE fracture (AP view): a. The intact medial side; b. Ruptures of the anterior tibiofibular and interosseous ligaments; and, c. A fibular fracture which is not seen clearly on an AP view.

Fig. 4b. Schematic drawing of a SE fracture (lateral view): a. An intact posterior tibiofibular ligament; b. A ruptured anterior tibiofibular ligament; and, c. A typical SE fracture of the fibula.

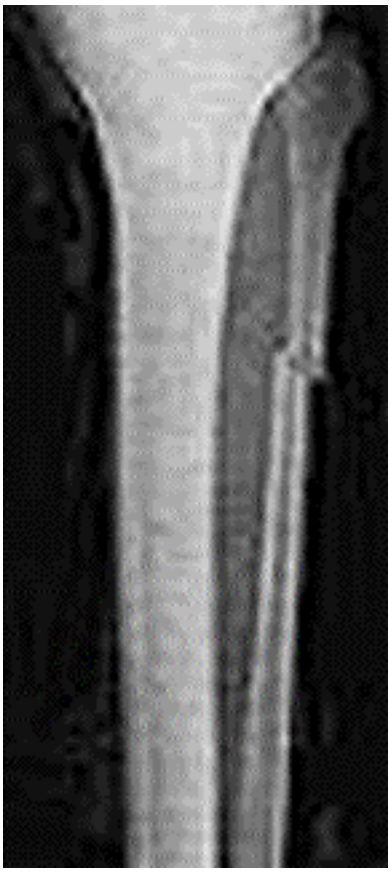


Fig. 5

Direct fracture of the fibula is most often seen at the midshaft of the fibula. Typically the distal fragment is medially displaced (Fig. 4) from a direct force on the fibula. In most cases the ankle is not involved and no tenderness is detected. Early weight bearing without immobilization is allowed after a day or two of local cold applications and perhaps use of an Ace bandage for some support. Careful examination of the ankle should be done to rule out a possible, though rare, double fibular fracture.

In the initial evaluation of an acute ankle fracture in which there is a fracture of the fibula above the syndesmosis of the ankle, it is most important to determine if the ankle is unstable. Careful examination of the medial and lateral structures of the ankle is essential and, if in doubt, stress x-rays should be obtained. Morphology of the fibular fracure reflects the type of the injury sustained. Pronation fracture types clearly indicate significant medial damage and an unstable ankle which needs surgical stabilization. Supination types of fibular fracture may, but does not have to be accompanied with a rupture of the deltoid ligament or a fracture of the medial malleolus. If the stress x-ray is negative, the ankle is stable and conservative management is indicated. Direct fractures of the fibula require minimal treatment.

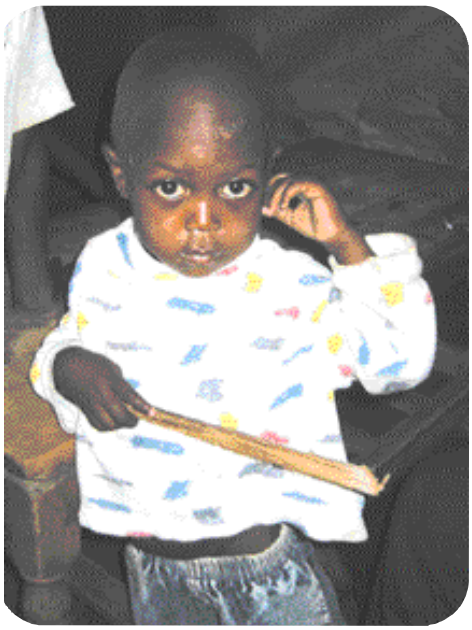
References:

1. Lauge-Hansen, N. Fractures of the Ankle, II. Combined Experimental Surgical and Experimental Roentgenologic Investigations. *Archives of Surgery* 1950; 60:957-985.
2. Pankovich, A.M. Fractures of the Fibula Proximal to the Distal Tibio-fibular Syndesmosis. *Journal of Bone and Joint Surgery* 1978; 60A:221-229.
3. Pankovich, A.M. Applications to Orthopaedics and Areas of Further Research. In V.T. Inman: *The Joints of the Ankle*, 2nd Edition, J.B. Stiel, Editor, Williams and Watkins, 1991; 85-97.
4. Pankovich, A.M. Classic Article: Acute Indirect Ankle Injuries in the Adult. *Journal of Orthopedic Trauma* 2002; 16:58-68.

Photo Gallery



Maj Smith from the 489th Civil Affairs Battalion, checks the heartbeat of a young local in Kophisophi, Afghanistan during a Humanitarian/Medical Assistance mission on July 20, 2002. The Humanitarian/Medical assistance mission is a part of ongoing operations for Operation Enduring Freedom in Afghanistan. *(U.S. Army photo by Spc. Patrick Tharpe) (Released)*



Elvis lives in Nirobi Africa, he is 2, and he is HIV positive. So is his mother and his older brother. His little sister, born just after his dad died, may not be because his mother was given nevirapine and she has never breast fed her. If you look closely you can see Elvis' belly is very swollen, the result of a terrible diet. HIV probably won't kill him, hunger will!



A combined team of medics secures an American soldier aboard an MC-130 Talon for transport from Bagram Air Base, Afghanistan. The team is (left to right) Staff Sgt Smith, a special operations forces medic, 1st Lt Thomas a senior flight nurse, Capt Bieniarz, a flight surgeon and Maj (Dr) Conte *(U.S. Air Force photo by MSgt Keith Reed) (Released)*



Capt Shepard and TSgt Cum accomplishing CASEVAC training on MH-53 at a deployed site in support of OEF.



SSgt Earle (kneeling), TSgt Cum (foreground), and Capt Shepard (background) accomplished CASEVAC training on MH-53 at a deployed site in support of OEF.

Dedication



Sergeant 1st Class Christopher J. Speer
A soldier remembered for Courage, Humor, and Faith.

Sergeant 1st Class Christopher J. Speer, 29, died of wounds sustained from direct action participating in Operation Enduring Freedom, 6 August 2002. SFC Speer was born in Denver, Colorado, 9 September 1973. He enlisted in the Army on 8 July 1992 and initially trained as a Medical Specialist. SFC Speer seeking a higher calling, volunteered for Airborne and Special Forces training. Upon successful completion of Special Forces training and now a fully qualified Special Forces medic, SFC Speer was assigned to various Special Operations units. In the mid-summer of 2002, SFC Speer was part of a team called in to support a quick reaction force from the 82d Airborne Division.

Ensuing action resulted in the destruction of an Al Qaeda hideout and several of its members. SFC Speer walked into a minefield to rescue two wounded Afghan children, according to fellow soldiers. He applied a tourniquet to one child and bandaged the other, they said. Then he stopped a passing military truck to take the wounded children to a U.S. Army field hospital.Speer saved those children, his colleagues said. That selfless act was among the memories of Speer that are celebrated by his fellow Army soldiers, their families and friends.

A former medic with the 3rd Special Forces Group (Airborne), his last assignment was to the Headquarters U.S. Army Special Operations Command. His decorations include the Bronze Star and the Purple Heart.



Chris Speer performing field sick call.

Special Forces Aidman's Pledge

As a Special Forces Aidman of the United States Army, I pledge my honor and my conscience to the service of my country and the art of medicine. I recognize the responsibility which may be placed upon me for the health, and even lives, of others. I confess the limitation of my skill and knowledge in the caring for the sick and injured. I promise to follow the maxim "Primum nonnocere" ("First, thou shalt do no harm"), and to seek the assistance of more competent medical authority whenever it is available. These confidences which come to me in my attendance on the sick, I will treat as secret. I recognize my responsibility to impart to others who seek the service of medicine such knowledge of its art and practice as I possess, and I resolve to continue to improve my capability to this purpose. As an American soldier, I have determined ultimately to place above all consid-

Pararescue Creed

I was that which others did not want to be. I went where others feared to go, and did what others failed to do. I asked nothing from those who gave nothing, And reluctantly accepted the thought of eternal lonliess ....should I fail. I have seen the face of terror; felt the stinging cold of fear, and enjoyed the sweet taste of a moment's love. I have cried, pained and hoped...but most of all, I have lived times others would say best forgotten. Always I will be able to say, that I was proud of what I was: a P.J. It is my duty as a Pararescueman to save a life and to aid the injured. I will perform my assigned duties quickly and efficiently, placing these duties before personal desires and comforts.

Navy Poem

I'm the one called "Doc"...I shall not walk in your footsteps, but I will walk by your side.I shall not walk in your image, I've earned my own title of pride. We've answered the call together, on sea and foreign land. When the cry for help was given, I've been there right at hand. Whether I am on the ocean or in the jungle wearing greens, Giving aid to my fellow man, be it Sailors or Marines. So the next time you see a corpsman and you think of calling him "squid", think of the job he's doing as those before him did. And if you ever have to go out there and your life is on the block, Look at the one right next to you... I'm the one

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